TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1897.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1898.

☞ SEE LAST PAGE OF COVER.

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The following papers have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the "Boston Transcript." As here presented, the papers are printed in full, and the discussions, where it appeared necessary, have been carefully revised by the speakers.

The Committee on Lectures and Publication take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature, in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

J. D. W. French,
B. M. Watson,
N. T. Kidder,
} *Committee on Lectures and Publication.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 2, 1897.

A stated meeting of the Society was holden today at eleven o'clock, the President in the chair.

This being the commencement of the term of office of the new board of officers and Standing Committees, the President, FRANCIS H. APPLETON, delivered the usual annual address, as follows:

ADDRESS OF PRESIDENT APPLETON.

Fellow-members of the Massachusetts Horticultural Society:

We find ourselves in the same location and within the same building at the commencement of a new year, during which I shall continue, through your votes, to have the honor and responsibility of presiding for a second term, and of endeavoring to do my part, under our constitution, to perform the duties of the office.

One year ago today I said to you, in part, that its founders did not suppose "that this Society would exist to see the day when it had outgrown the arrangements which were made for it by their successors, upon this site, only thirty (now thirty-one) years ago." I now repeat that statement, as applicable today as then.

Your chosen officials have had this subject under consideration during the past year, and are still unable to present any recommendation, with a view to improving our home, for your favorable consideration. In this I believe your Committee to be unanimous.

In the city of Philadelphia there has been dedicated and opened, during the past year, a new fire-proof building for the Pennsylvania Horticultural Society, designed to promote the work in which we, of this Massachusetts Society, are all interested.

The land upon which the Pennsylvania Society has built was owned by William L. Shaffer, thirty-four years a member and seventeen years president, who, at his death in August, 1884, left his entire estate to his sister, who, in May, 1887, by deed of trust, placed the land and a building which had previously been used by the Horticultural Society in the hands of trustees and their successors, to hold forever for the benefit of the Pennsylvania Horticultural Society. In May, 1893, the hall was a second time destroyed by fire.

In the autumn of 1894, on approval of the Society, it was leased for thirty years by the said trustees to five gentlemen, who, as trustees for the bondholders, secured an issue of income bonds, bearing interest at three per cent, $200,000, with which, together with $25,000 insurance money, the new building has been built.

The uses to which that new building can be put seem to me to be uses for which a horticultural building can well be erected in this growing city of Boston, and meet a long-felt want; which, at the same time, would be of a plan best calculated to advance and promote the direct objects for which this Society was incorporated, *i.e.*, "for encouraging and improving the science and practice of horticulture."

In considering the future of our Society, it seems to me advisable to give prominence to our own needs by stating how similar needs have been met by our allies in Pennsylvania.

The Horticultural Building at Philadelphia is located centrally upon a lot of land two hundred by ninety feet, so situated that it is easy of access by carriage or street car. Some of its entrances are under cover, and all are well planned. Its offices, reception and ante-rooms are commodious, and will accommodate at least one thousand people. These, with a lecture hall and grand staircase hall, are on the first story. From the grand staircase one enters the large hall, seventy by one hundred feet, which has a vaulted ceiling at a height of thirty-five feet. This latter room will seat eleven hundred persons for concerts and lectures, and five hundred for banquets, and is admirably suited for large assemblies.

All these uses promote a market for horticultural products, and encourage advanced taste of both palate and mind, which helps to promote the Society's chartered object.

The halls are well lighted from outside by day and by electricity at night, and are well ventilated. I have said that the building is rated as fire-proof.

At the west end of the large hall is a platform, below which, and upon a level higher than that of the first floor, are six small rooms. In the front part, and on the same level with the large hall, is a suite of rooms consisting of a small hall and two supper rooms, where suppers can be served when entertainments are in progress in the large hall, or all can be used in connection with the large hall. Serving-rooms are in the front part of this floor under a convenient balcony, which, by elevators, connect all of this floor with the kitchens, pantries, and china closets on the third floor.

While all that is thus described can add to the income and promote horticultural aims, the opening into one extensive promenade of all the space on the second floor, by a system of sliding partitions or folding doors, makes a superb opportunity to display plants, flowers, fruits, vegetables, etc., in a most complete way.

An elevator, the floor of which can form a section of the floor of the large hall, delivers plants of any reasonable height, and all other exhibits, conveniently. Rubber-tired cars can be used to bear them to any part of the first or second stories.

A basement that is largely above ground affords ample accommodation for floral and other horticultural business, and also for the Society's storage, dynamos, boilers, etc.

The Pennsylvania Society's Library appeared to be smaller than ours, but a new building, whether on this site or some other, or our present building remodelled, can always be planned to meet the needs in this direction.

Whatever may be done in the future to improve our home facilities, may we be able to secure as useful a home for our chartered purpose as has the society to which I have been calling your attention secured to promote Pennsylvania horticultural interests.

Are we now, by the liberal expenditure for prizes, advancing the science and business of horticulture as much as in our power? is a subject that we should all take into serious consideration.

To carry on our work we must have income, and the larger our income the greater must be our success on the lines for which we are incorporated; and, provided we apply it most wisely and conservatively, it will continue to us in increasing quantity.

It would not, in my opinion, be lessening our benevolent work, but rather increasing it, to charge a reasonable fee to non-members visiting our exhibitions, subject to a judicious issue of the usual complimentary passes.

Our Society should be benevolent to the public by allowing the non-members to contribute toward the good that the Society aims to do for the public and horticulture in general.

If our exhibitions are to increase in horticultural profit to those who view them, and the prizes are to continue in their present or increased liberality to those who win them, the non-member beneficiaries can, and in reason will, be ready to contribute toward the success and perpetuation of our work.

Our Library is valuable, and appeals to lovers of horticulture to make greater use of the books upon its shelves. Considerable work is done and money spent, annually, to keep it in an advanced condition, and we hope that all possible good to the State shall come from its being well used. To make its value known is one way to increase its usefulness.

The lectures given during the past season by the Society were generally of much value, and their usefulness was promoted as much as was possible by the help from lantern-slide pictures.

We were fortunate in having with us, as lecturers during the season of 1897, officers of the Department of Agriculture at Washington, and professors from universities and colleges, as well as men of practical experience, and we can congratulate the Committee and ourselves upon the result.

The small attendance at our adjourned meetings would seem to indicate either a decreasing interest in our work, or that our members believed that our business meetings were too frequent. I have been led to examine our constitution to see by what authority our monthly business meetings are held. I find only four stated meetings required by our constitution, *i.e.*, the first Saturdays in January, April, July, and October, with provision for calling other meetings when deemed necessary.

The Executive Committee are to meet monthly, and to report

on the first Saturday of each month, with the names of such persons as they recommend for election. Judging by the present custom in clubs and associations, it is a fair interpretation of this last provision that such names are to be either kept on file, or posted in the building by the Secretary until the next stated meeting, when they shall be voted upon by the Society.

I believe that it may increase the interest in the Society to follow the plan which is thus suggested by our constitution, rather than to adjourn our stated meetings with very little occasion, as has been simply a custom. I believe this will be returning to a former custom.

During the past year the Society has lost by death 33 life members, and gained 24; and has lost by death 13 annual members, and by commutation to life membership 1; while 5 annual members have resigned, making a loss of 19 annual members, with a gain of 18.

The use of the library appears to have decreased, and I suggest that if the Committee on the Library shall make a rule limiting the time during which books can be kept from the library room, such a rule might help develop the usefulness of the library. The value of the library should become better known to the students of horticulture, and it is hoped that such may result.

I commend to your careful consideration the several reports of your Standing Committees, from which you will gain information as to those departments, and learn of the suggestions therein made for the good of the Society.

Those reports will be printed in the Transactions, which I hope will be issued soon, in order that their usefulness to you may thus be the greater. With the intelligence that can be found in our printing offices today, those can be found who will assume the responsibility of technical work, and thus expedite to our benefit in this case, for example, what might otherwise cause much delay under old-fashioned methods.

The interest in the mushroom, a most nourishing food when the edible species are known to the gardener, has grown largely within the past few years, and a more general knowledge among our people of what are the edible species, and what are their characteristics, is desirable.

I have asked Mr. Hollis Webster, an expert, to give me a few points to incorporate into my address, but as he has so well

expressed the views of the mushroom lover in a letter to me, I shall present it as being what I would call to your attention.

Hoping that this new year may bring profit and happiness in all due quantity to our members, and expressing my appreciation of the honor of again serving you in this chair, we will now continue the usual order of business.

The appropriations previously recommended by the Executive Committee for the year 1897 came up for final action, and were unanimously voted, as follows:

For Prizes and Gratuities:

For Plants	$2,000
For Flowers	2,600
For Fruits	1,800
For Vegetables	1,200
For Gardens	500
Total for Prizes and Gratuities for the year 1897,	$8,100

These amounts are the same as last year, except that for Vegetables, to which $50 is added.

The following appropriations were also recommended, all being the same as last year:

For the Committee on Lectures and Publication, this sum to include the income of $50 from the John Lewis Russell Fund	$300
For the Committee of Arrangements, this sum to cover all extraordinary expenses of said Committee	400
For the Library Committee for the purchase of magazines and newspapers, binding of books, and incidental expenses of said Committee	400
For the Committee on School Gardens and Children's Herbariums, this sum to cover all incidental expenses of said Committee, and to be paid through the usual channels	250

The Executive Committee further recommended that the sum of $38 be transferred to the Flower Committee from the unexpended balance of the appropriation for the Fruit Committee, to cover the deficit in the awards made by the Flower Committee in 1896, the same not to establish a precedent.

The Executive Committee also reported that they had procured

an act in addition to the act incorporating the Society, empowering it to hold real and personal estate to an amount not exceeding one million dollars.

The Executive Committee reported the appointment of Charles E. Richardson as Treasurer and Superintendent of the Building, and recommended to the Society to appropriate $1,500 for his salary. The Committee also reported the appointment of Robert Manning as Secretary and Librarian, and recommended the appropriation of $1,500 for his salary.

These reports were unanimously accepted, and the recommendations therein adopted, and the appropriations recommended were voted.

John G. Barker, Chairman of a Committee to prepare a memorial of the late Samuel G. Damon, reported as follows:

The Committee appointed to prepare a memorial of our late associate, Mr. Samuel G. Damon, respectfully report that they have attended to their duty, and present the following preamble and resolutions:

Whereas, It has pleased our Heavenly Father in his wise providence to remove from our number Mr. Samuel G. Damon, we desire to place on record our appreciation of his worth and labors.

Mr. Damon had been a member of this Society for thirty years, and during that time was a constant contributor to the exhibitions. Fruit was his specialty, and he excelled as a cultivator of hardy grapes and pears, and carried off many first prizes as evidence of his skill in this department of horticulture.

In all the walks of life he was an upright and honorable man, and a perfect gentleman, and while we miss his presence among us his memory and influence still live. Therefore be it

Resolved, That we deeply mourn the loss of this most worthy member, and sympathize with his family in the still greater loss they have sustained.

Resolved, That this preamble and resolutions be spread upon the records, and that a copy be sent to the family of the deceased.

JOHN G. BARKER,
E. W. WOOD,
C. F. CURTIS,
Committee.

The memorial was unanimously adopted.

E. W. Wood was granted further time to prepare his report as Delegate to the State Board of Agriculture.

On motion of Ex-President William C. Strong, a vote of thanks to the President for his annual address was unanimously passed, the question being put by the Secretary. The President expressed his pleasure at the appreciation by the Society of his efforts to serve it.

E. W. Wood, Chairman of the Committee on Fruits, read documents looking to legislation for the prevention of the disease of the peach known as "yellows." A motion that the Society take part in the effort to secure such legislation was negatived, after discussion by several members.

The President read a letter from the Executive Committee of the Boston Mycological Club, thanking the Society for the hospitality extended to the Club, and expressing their high appreciation of its value; without it they would hardly have been so successful as they were in extending so widely the knowledge of this branch of the Society's work.

John Mutch, of Brookline, and
Henry S. Adams, of Dorchester,

having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected.

The President announced that the first of the series of weekly lectures for the present season would be given on the next Saturday, by Professor George L. Goodale, of Harvard University; subject, "Tropical Horticulture," with stereopticon illustrations of the principal Economic Plants of Hot Climates, and that the lectures would be free to all.

The meeting was then dissolved.

MEETING FOR LECTURE AND DISCUSSION.

Saturday, January 9, 1897.

A meeting for Lecture and Discussion was holden at eleven o'clock today, the President, Francis H. Appleton, in the chair. The lecture was on

Tropical Horticulture, with Illustrations of the Principal Economic Plants of Hot Climates.

By George Lincoln Goodale, Professor of Botany in Harvard University, Cambridge.

Tropical horticulture is likely to attract more and more attention at the hands of our younger and more enterprising students of the subject of botany as increased facilities are afforded for gaining an acquaintance with the capabilities of the tropics. And with this increase of opportunity there will probably come increased interest on the part of investors and business men in different lines of commerce depending on the products of tropical agriculture and horticulture. As some now present are aware, considerable increase of interest in this matter has already been manifested in this vicinity, and already a good amount of capital has gone forward in lucrative undertakings of this nature.

Therefore it will not be out of place in a meeting in this hall, devoted to the advancement of horticulture in general, to present some of the phases of this subject and call attention to some of the requisite cautions which possibly may be forgotten. It must be remembered that the subject should be most carefully examined by all those who intend to engage in tropical pursuits, and the numerous works of a practical character on the subject leave little excuse for such persons to be ignorant in regard to conditions which will confront them in the tropics. Referring, then, all inquirers who have in mind undertaking tropical horticulture to the treatises of a practical character, many of which can be seen in the excellent library of the Massachusetts Horticultural Society, I shall pass at once to a brief consideration of a few salient points of some general interest, and illustrate the subject by numerous photographs of tropical vegetation.

Our cursory survey will be confined to the moist tropics, and will not touch the interesting matter of the deserts, reclaimable and irreclaimable. The tropical climate which we are to look at is best exemplified in the equatorial belt. The climatic conditions of this zone have been most graphically described by Belt, Bates, Charles Kingsley, and Alfred Russell Wallace, whose works are absorbingly interesting from every point of view.

From the works of one of these authors I shall cite a description of a tropical day. And as you examine the peculiarities of an equatorial day, you will remember that near the Tropic of Cancer and the Tropic of Capricorn the climate is by no means as equable as that near the Equator. Wide ranges in temperature and rain may come in with the changing seasons, and annual vegetation may go down even to the verge of extinction, as is now the deplorable case in parts of the south and middle of India. Bearing this in mind, we may consider the equatorial day. I quote from Mr. Bates, the naturalist in Nicaragua. He begins with the morning, in which there is no twilight. Day is not ushered in by dawn as with us.

"At that early period of the day [the first two hours after sunrise] the sky was invariably cloudless, the thermometer marking seventy-two degrees or seventy-three degrees Fahrenheit; the heavy dew of the previous night's rain, which lay on the moist foliage, becoming quickly dissipated by the glowing sun, which, rising straight out of the east, mounted rapidly toward the zenith. All nature was fresh, new leaf and flower-buds expanding rapidly. . . . The heat increased hourly, and towards two o'clock reached ninety-two degrees to ninety-three degrees Fahrenheit, by which time every voice of bird and mammal was hushed. The leaves, which were so moist and fresh in early morning, now became lax and drooping, and flowers shed their petals. On most days in June and July a heavy shower would fall sometime in the afternoon, producing a most welcome coolness. The approach of the rain-clouds was after a uniform fashion very interesting to observe. First, the cool sea-breeze which had commenced to blow about ten o'clock, and which had increased in force with the increasing power of the sun, would flag and finally die away. The heat and electric tension of the atmosphere would then become almost insupportable. Languor and uneasiness would seize on everyone, even the denizens of the forest betraying it by their motions. White clouds would appear in the east and gather into cumuli, with an increasing blackness along their lower portions. The whole eastern horizon would become almost suddenly black, and this would spread upwards, the sun at length becoming obscured. Then the rush of a mighty wind is heard through the forest, swaying the tree-tops; a vivid flash of lightning bursts forth, then a crash of

thunder, and down streams the deluging rain. Such storms soon cease, leaving bluish-black, motionless clouds in the sky until night. Meantime all nature is refreshed; but heaps of flower-petals and fallen leaves are seen under the trees. Towards evening life revives again, and the ringing uproar is resumed from bush and tree. The following morning the sun again rises in a cloudless sky; and so the cycle is completed; spring, summer, and autumn, as it were, in one tropical day. The days are more or less like this throughout the year. A little difference exists between the dry and wet seasons; but generally the dry season, which lasts from July to December, is varied with showers, and the wet, from January to June, with sunny days. It results from this, that the periodical phenomena of plants and animals do not take place at about the same time in all species, or in the individuals of any given species, as they do in temperate countries."

It is under conditions like these that the tropical cultivator has to live and carry on his work. The enervating influence of the climate upon a resident of the cooler zones is very marked, but with proper precautions as to living according to the stern rules of hygiene, life can be made very safe.

[At this point Professor Goodale introduced on the screen many stereopticon views of the dominant vegetation of the tropical climates, both north and south of the equator. The description of these views obviously cannot be given in this report.

The lecturer then proceeded to the consideration of some of the more important food plants of the tropics and sub-tropics, and their cultivation.]

Tropical cultivation of food plants is interesting from the ethnological standpoint. In warm climates where men can easily procure enough food to sustain life there is little incentive to exertion. If a small group of cocoanut palms and a few banana plants yield all the food one wants, why should any pains be taken, for instance, to raise rice? However, the natives of hot, moist climates do attend to the cultivation of a few food plants, one of the reasons being that they wish to vary the monotony of diet.

Many tropical products reach the markets of the world directly from the wild plants, but many of these plants are coming more and more under cultivation. The cultivation is, as can easily be understood, largely under the stimulating influence of

foreigners in these hot climates. Their enterprise, such as it is, lies at the basis of nearly all such cultivation of tropical crops.

Among the more commonly cultivated tropical products are spices, a few palms, textile plants, sugar-cane, certain varieties of tobacco, a few coloring matters, and many food plants. A few of these plants are now to be reviewed, and we may begin with the food plants.

Rice. — As raised in Ceylon, the land in which rice is to be planted is laid out so as to be saturated with water as required. The soil, being covered with a few inches of water, is stirred up by implements, or by driving bullocks hither and thither over it. In this loosened soil the seeds are placed and the quickly grown plants, with their tender green shoots, soon give the field a beautiful appearance. By and by the nodding heads show that the grain is growing heavy, but the vigilance of the cultivator does not relax. The ground is frequently saturated and search is made for the enemies of the plant. When the harvest comes the laborers secure the crop mostly by hand, as the grains are so easily detached that great care must be taken to grasp each cluster firmly before it is cut off. The rice is then husked and the dark brown grains become the beautiful white ones we know so well. In the Botanical Museum at Cambridge these processes are illustrated by photographs and the products are shown in all stages. Near by is another collection which at this time possesses great pathos — that of the famine-grains of India. Only the well-to-do can use rice, and cheaper grains are the food of the poor. But this year these have failed and a terrible famine is approaching parts of middle India, and before many months have gone, thousands will have died of starvation. The reason for this is that these people live just north of the equable equatorial belt, where the climatic conditions are unfavorable.

Coffee. — The coffee of commerce is raised within the tropics. Given by Arabia to the Malayan Archipelago and to parts of India and Ceylon, it has generally flourished. In Ceylon, however, it has had an almost fatal check from a destructive fungus and an equally destructive insect. The coffee plant at a distance sometimes resembles one of our Viburnums, but often takes the shape of a tree. Approaching, one sees the glossy dark-green

leaves, white flowers, and forming fruit. The trees, which are placed far enough apart to give room for gathering the ripe berries, require little care beyond keeping the ground clear at their base and removing any scale or other insects. When ripe the berries are gathered and "pulped." The seeds are generally two, with flat faces which come together. Sometimes only one seed ripens, and becomes round. It is then called "pea-berry" or "male-berry." These seeds are next separated from a parchment-like membrane which clings to the interior cleft, and after drying are ready for shipment.

Tea. — The different varieties of the tea plant are probably all referable to two species of Camellia. In hot climates like Ceylon it is possible to get an excellent product at less risk of injury, and cheaper, as to mere raising, than in China or Japan. But it is subsequent treatment which largely controls the price. The plants must be good, to start with, and must have good soil. When ready for the first picking the laborers snip off with thumb and finger the tips of the branches. When the bush is thus stripped it is ready to have the axillary buds start out and give new growths of fresh tips, and so on, a new picking being possible as often as the shoot is ready. The picked tips are brought to the factory and dried, and prepared to constitute green tea. Nowadays it is more common to let the leaves wilt a little, and undergo a process of change which is improperly but very generally called "fermentation," by which they become much blackened. They are then rolled by ingenious machinery and carefully dried. This is a very brief account of the usual process now adopted in Ceylon and parts of India for the preparation of certain forms of black tea. In Ceylon and India it is possible to have a good many "flushes" of fresh shoots and tender leaves during the year, whereas in more northern regions the number of pickings is much less. Obviously the most costly factor in the production of tea is the labor in picking it. This renders it practically impossible to cultivate tea profitably under existing labor conditions in our own South.

At the present time tea is seldom adulterated. The very cheap teas in the market are chiefly those which have been injured by keeping, or have suffered in some way during manufacture or transportation. Besides them, there are good cheap teas which are simply from coarser leaves.

Cacao. — Chocolate plants, as we shall now for convenience denominate the Cacao trees from which chocolate is prepared, were originally carried from America to the Old World. They are now cultivated in many parts of the eastern tropical belt, as well as in Central and South America and the West Indian Islands. The plant demands rich soil and a good deal of shelter. One of the most interesting features of this plant is the coming out of the blossoms and fruit on the older parts of the stems. After the fruits are gathered they are opened and their almond-like seeds are spread out for the removal of a part of the pulp. They then undergo a kind of heating process, popularly and not very improperly called "fermentation." The seeds freed from the still clinging, but now rather dry pulp are ready for shipment.

[The cultivation of the banana and its allies and the treatment of palms for the best yield of fruits were next considered at much length, after which the subject of spices came up. The lecturer then spoke of the life of the tropical horticulturist, noting his fondness for plants strange to his own surroundings. He enumerated the principal annoying weeds of the tropics, especially Mimosa and the tuberous species of Oxalis.]

Ginger, Annotto, Curcuma, and a few other species were studied by me in a plantation where Cacao was being successfully cultivated. The work requires a large margin of capital, energy, patience, and health. The tropical cultivator, especially he who has large interests, is subjected to a heavy strain in such a climate. There are perils from invasions of insects and fungi to be guarded against. There are constant improvements in varieties, eagerly seized by competitors, and these must be met. The delights, however, are many, and are attractive to certain temperaments. Nature is at its best in the tropics; life is full to the brim. Though there is not the keen zest in sports and study which is gained from the crisp air of a colder climate, still one can retreat to the hills to gather fresh strength for a new lease of life in the plains. For the children of the English-speaking planter such retreat is absolutely necessary, at short intervals.

If now, in brief résumé, we reduce this complicated question to its lowest terms, we see that tropical horticulture has this remarkable peculiarity: it is conducted under conditions wholly favorable to the life of plants. But just here lies the peril. What is good for one plant is, generally speaking, good for another, and

hence the cultivated plants thrive luxuriantly, but so do weeds and foes. This is illustrated in a striking manner by the growth of Coffee in Ceylon. Everything favored the Coffee plant. Nature was in every way most propitious, but the conditions were favorable also to destructive fungi, and these began their disheartening work. The most destructive of these, here and there assisted, as I have already said, by a destructive insect, ravaged the plantations so completely that the excellent Ceylon Coffee became almost lost to commerce.

It is therefore warfare of a most unrelenting kind which man must wage against the foes of cultivated plants in the tropics. He must at every point aid his protégés which have been rendered almost completely helpless by long-continued assistance from man. When the hand or aid of man is withdrawn, the cultivated plant either falls an easy prey to its foes or it relapses into a sort of quasi-defence, which often suggests the wild condition from which it sprang.

While, therefore, there is very much to encourage the novice in tropical horticulture there is very much that is preëminently discouraging. Tropical horticulture is far from being a sinecure. It demands earnest study of the conditions of plant life in all its relations, and it requires, also, a knowledge of the difficulty of getting good work done under tropical skies. Under exceptional conditions good work is done by natives, but as a rule they are apathetic and it is hard to secure faithful service. The young man who leaves a northern home for tropical venture must make up his mind to hard work under unfamiliar conditions. With this steadily in mind such ventures, under the precautions referred to, can be reasonably successful.

[The lecture was illustrated throughout by stereopticon views, chiefly of Ceylon, the Straits settlements, Java and the Malayan Archipelago, together with some of the newer plantations in Northern Queensland and Polynesia. Professor Goodale also referred to a Chinese book on the cultivation of Rice, in the Library of the Horticultural Society, with plates giving a vivid idea of the cultivation of that grain in China.]

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 16, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President CHARLES H. B. BRECK in the chair. The following lecture, which was fully illustrated with stereopticon pictures, was delivered:

THE STRUCTURE AND CLASSIFICATION OF MUSHROOMS.

By HOLLIS WEBSTER, Secretary of the Boston Mycological Club, Cambridge.

Whatever may be the cause of the present popular interest in mushrooms, it is evident not only to botanists, but to casual readers of the monthly periodicals and of the daily press, that within a few years this interest has grown largely, and that it is spreading widely. Its manifestations are various and unmistakable; but most of them have taken the form of demands for information and of the responses of those who have been willing to give it. Three years ago, for instance, there appeared three responses to this demand, one from an artist,[1] whose nature studies have made him popularly known; one from the State Botanist of New York,[2] who has for thirty years given special attention to the subject; and one from the Professor of Cryptogamic Botany at Harvard.[3]

Most of the numerous articles that have recently appeared have been concerned with showing the difference between edible and poisonous kinds of mushrooms (or toadstools, which are the same thing), and have been addressed to the general public. There are, however, many persons who wish to know something about mushrooms as plants, and perhaps to engage in limited studies concerning them. These people generally lack a knowledge of the elementary facts concerning structure and classification that would make easy an attack upon the literature of the subject. To such would-be students of a small part of the field of mycology this lecture is addressed in the hope that it may be of some assistance.

At the outset it will be well to come to an understanding as to the term *mushroom* itself. In every-day language it usually

[1] W. H. Gibson, in "Harper's Monthly Magazine" for August, 1894.
[2] C. H. Peck, in the "Cultivator and Country Gentleman," May 31–Sept. 20, 1894.
[3] W. G. Farlow, in "Garden and Forest," Jan. 24–Feb. 28, 1894.

means the sort of fleshy fungus that is good to eat, and particularly — to some people only — the common pasture kind. A *toadstool*, on the other hand, means something poisonous, or at least to be avoided. As a matter of fact, no distinction can be made between the two terms, though the term toadstool is more comprehensive, for it may be used to include the common pasture mushroom and all other fungi whose form is in general the same. Both terms are also loosely applied to other kinds, even to such forms as Puff-balls and Stink-horns.

If we look at a common mushroom of the pasture or the market, we see that it may be easily divided into two parts, an upright stalk, called the *stipe*, and a flat, expanded portion, the *cap* or *pileus*. Attached to the under side of the cap are membranous plates, the *gills*, or *laminæ*, radiating from the top of the stipe to the edge of the pileus. The upper part of the gills is attached to the lower surface of the cap, and their lower edges, which are usually very thin and rather sharp, hang free. In the mushroom that we are examining there is a space between the crowded inner ends of the gills and the top of the stem. In other kinds of mushrooms we may find the same condition of things, or it may be that the gills reach the stem and are attached to it, or even run down upon it as ridges, which in some cases end abruptly and in others are gradually reduced to mere lines. Upon the gills are borne in countless numbers the spores — exceedingly minute bodies, which, as it is their office to germinate and grow into new mushroom plants, may be roughly compared to seeds. The mushroom, in fact, as we see it, is nothing but a contrivance for the production and dissemination of the spores. The arrangement of the gills gives an enormous spore-bearing surface, whence the spores are carried by the wind or by insects, or drop to the ground below. If the cap of a fully grown mushroom be cut from the stem and laid, gills downward, on paper under a tumbler or other cover to keep draughts away, there will be found on the paper after a few hours — sometimes in a very short time — a layer of spores, making a negative print of the gills. In the common mushroom this print will be of a dark brown — almost a purple brown — the color, it will be noticed, of the gills at maturity, for the gills usually take the color of the spores.

Stem, cap, and gills are characteristic parts of most of the fungi commonly called mushrooms or toadstools. There are

other structures, however, peculiar to certain groups. These are a *volva*, a *ring*, and a *veil*. Of the volva, or sheath, characteristic of the poisonous Amanita, a description will be given presently. The common mushroom does not possess it, but does show us a ring and veil.

If we look at a young specimen that has not been long above ground and is still in its compact, rounded form, called by mushroom-growers a *button*, we shall see no gills on the under side of the cap. Indeed, the mushroom may sometimes grow to nearly its full height before they are visible. The reason is easy to see, for stretching unbroken from the edge of the unexpanded pileus to the stem is a delicate membrane called the veil. As the pileus expands, the veil is torn. Shreds of it, perhaps, cling to the edge of the cap, but most of it remains, encircling the stem and thus forming a ring, — a structure the appearance and size of which vary in the different sorts of mushrooms which possess one.

In the genus Amanita, for instance, there is a conspicuous veil. Moreover if you will look at the base of the stem, you will see something else — something like a membranous bag or sheath, from which the stem emerges. Now, when a young Amanita pushes up from the ground, this sheath or bag, technically the volva, encloses the entire plant. As the cap and stem press upward, the volva is ruptured at the top. In the mature plant its remnants are to be found at the base of the stem and sometimes in scattered scaly fragments on the top of the cap. The volva is not in every case so conspicuous as in the example first shown. In others it is reduced to a ridge running round the swollen base, or even to scales. Since the base of the plant is often below the surface of the ground, and the stem breaks easily, care must be used in gathering specimens if the volva is to be secured intact.

The structures so far spoken of are easily seen, but there is much more to a mushroom than this.

You have been told that a mushroom is simply a contrivance for bearing spores. It is thus comparable to the fruit of a flowering plant, which develops and contains the seeds. Where, then, you will ask, is the vegetative part of the plant, the part that absorbs the nourishment and does all the preparatory work of which the growth of the mushroom itself is the result? In other

words, what sort of a plant develops from a spore and where does it live? If you could follow, as you may under a microscope, the germination of a spore, and the stages of growth which follow, your eyes would give you the answer to the first part of this question. You would see the minute spherical or ellipsoid bodies, when supplied with the requisite moisture, burst and put forth slender colorless threads called *hyphæ*. These in time branch again and again, extending constantly in length to form what is called the *mycelium*, or vegetative part of the plant. When such threads are massed together in strands, forming white lace-work or cottony bunches, they are easily found in the substratum on which the fungus grows — in rotten wood, for instance, or in a heap of leaves, or other decaying vegetable matter. In such places the mycelium spreads over or permeates the substance from which it draws its food supply. For fungi do not elaborate their food from raw materials as do the plants that have green coloring matter, but are dependent upon other vegetable or animal organisms, either living or dead; that is, they are parasites, or saprophytes.

What is known by mushroom-growers as the *spawn* consists of a dried compressed portion of a mushroom bed, generally mixed straw and horse droppings, which is permeated by the mycelium. In this condition, in the form of flakes or bricks, it may be transported, and will keep its vitality for months, active growth being for the time arrested. As a rule, then, when mushroom beds are started, it is the mycelium or spawn which is planted — not the spores. When the proper conditions of warmth and moisture are supplied, growth is resumed, and the threads, lengthening, branching, and anastomosing, very soon spread throughout the bed.

It is plain, then, that the mushroom plant for most of its life is out of sight, and consequently not familiarly known. To this fact are due many erroneous notions about the origin of mushrooms themselves. When the time has come for the plant to produce its fruit, there form at various points in the mycelium small masses of densely branching interwoven threads, which in time enlarge to an appreciable size. Each of these masses is the beginning of a button, or nascent mushroom. An examination of buttons in various stages of growth, by means of thin sections brought into the field of a compound microscope, shows pretty clearly the part played by the hyphæ in the mushroom proper, the

substance of which is made up of the compacted and closely interwoven threads and their branches. Along certain radiating lines is formed the framework of the gills, which in the developed mushroom is called the *trama*. Just below the gills an air space appears, the outer wall of which becomes the so-called veil. Lastly, upon the surface of the gills develops a layer of cells standing side by side like the single threads in the pile of velvet or in the surface of an Oriental rug.

With these cells we have a special concern. Taken together they form the *hymenium*, the spore-producing tissue, which, folded like a fan, is applied to both sides of the gill-plates. A section through a gill shows us this layer. Each one of the club-shaped spore-bearing cells composing it is called a *basidium*. Each basidium bears four spores on minute stalks.

So far we have dealt exclusively with gill-bearing mushrooms, a group to which as a whole is given the name Agaricini. There are other common kinds in which also basidia and spores are developed on an exposed hymenial surface. The hymenium is disposed in different ways. In one group, a large one, it lines the inside of small tubes which are fastened vertically, with the open mouths downward, in a closely packed mass on the under side of the pileus; this is the group of Polyporei. In a third group, the Hydnei, it covers the surface of spines, teeth, or other protuberances. In a fourth it is smooth, without distinctive feature, evenly spread over one or both sides of the tough, or coriaceous, thin body of the plant; this is the character of the Thelephorei. In a fifth group, the Clavariei, the plant is tender, fleshy, erect, and often densely branching, bearing the hymenium on all sides of the tips of the branches. Last are placed the rather shapeless, gelatinous Tremellinei, which shrivel when dry, and swell again with moisture; in these the hymenium covers the outer surface. From the similar nature of the hymenium and its exposure in these six groups they are classed together as the Hymenomycetes. To this natural class, "vasta Fungorum classis," as it was called by Fries, whose treatment of it still remains the basis of later classifications, belong most of the fungi commonly termed mushrooms or toadstools.[1]

[1] A good systematic account of the class as it appears in Great Britain, a work which in the absence of one specially adapted to this country is exceedingly helpful to a student, is Stevenson's "Hymenomycetes Britannici."

This class, however, does not include all the fleshy fungi, or even all those in which there is a hymenium with spore-bearing basidia. In a second class, much smaller, there is a similar method of fruiting; but the hymenium is not exposed, at least at first. A common puff-ball is the best example. A microscopic examination of the interior of a puff-ball shows that it is composed of a mass of chambers the walls of which are covered with basidia, the similarity of which to those in the class first treated is very plain. The chambers, however, are partly filled with branching threads, together called the *capillitium*. When the puff-ball is ripe and breaks open at the top, it is found that the chamber walls have become disintegrated and that the disconnected threads of the capillitium are left, together with an immense collection of spores, all in a dry state and ready to be caught by the first breath of wind. From the shape of the fruiting mass in the puff-ball and allied forms this class is called the GASTEROMYCETES. Since the class is small, our botanists have been able to describe most of our species, at least those of the Eastern part of the United States; and fairly exhaustive systematic accounts of them are to be found in the papers of Burt, Morgan, and others on the Phalloids or Stink-horns, and of Peck, McBride, Morgan, and others on the Puff-balls.

Fructification by means of spore-bearing basidia unites these two classes, together with others composed of less conspicuous fungi, under a still more comprehensive name, that of BASIDIOMYCETES.

There still remain a few mushrooms not included in the groups spoken of, namely, the *Morels*, *Helvellas*, and *Pezizas*. The first two are stalked, and roughly resemble the familiar Agarics; the last are shallow cups or fleshy expansions. A word as to the form of their fructification must suffice. Examination under a microscope of a bit of the outer or upper surface of one of these plants will reveal structures at first sight much like those in the Basidiomycetes. A mat of crowded slender cylindrical cells is seen covering the surface; none of these cells, however, bear spores on their tips. Instead, some of them — not all — contain spores in their interior. Each is, in fact, a little enclosure, called an *ascus*, and if one that is mature be separated from the rest, it will readily be seen to contain eight — almost invariably eight — spores. At the proper time these escape from the asci,

sometimes suddenly and myriads at once. From the surface of a Peziza, for example, as you look at it, there comes a little puff of smoke as the ejected spores are shot into the air to be blown away in a tiny cloud. Pezizas, Helvellas, and Morels are some of the *Discomycetes*, a class excellently treated for Great Britain by Phillips. Multitudes of fungi besides the Discomycetes have a fructification which consists of asci, and the comprehensive name for all of them is Ascomycetes.

Most of the mushrooms gathered by the increasing number of fungus hunters, at least by beginners in the study, belong to that class of Basidiomycetes called Hymenomycetes. Among these an Agaric is at once recognized by its gills; a Boletus or Polyporus by its pores; a Hydnum by its tooth-like projections; a Clavaria by its coral-like appearance; and a Tremella by its gelatinous nature. So far identification is a simple matter; but to go farther and decide upon the species requires close study, accurate observation of details of structure, ability to interpret published descriptions, and most of all experience. Many of you know well enough the difficulties you meet in "running down" a flowering plant in Gray's Manual — difficulties which arise often from incomplete knowledge of the structure of the plant, but sometimes from the lack of sharply defined and conspicuous characters in the species itself. The same difficulties meet you in the determination of mushrooms, aggravated by the lack of a Gray's Manual and not infrequently by incomplete or misleading descriptions in the books available.

The most frequent puzzles in identification are among the Agaricini, or gill-bearing mushrooms, whose numbers enormously exceed those of any others you are likely to collect. Since for the most part they are built on the same general plan, and resemble one another at first sight much more strongly than they differ, the task of separation demands close scrutiny and a practised eye. Every detail of structure must be noted: the shape, surface, color, and markings of the cap; the thickness and character of the flesh; the color, shape, and method of attachment of the gills; the nature of the stem inside and out; the presence or absence of ring, veil, and volva, and the nature of each; and also the color and sometimes the shape and size of the spores. No permanent character, whether gross or minute, must escape the eye.

A brief outline of Fries's classification of the Agarics will indicate how the most prominent of these characters are seized upon for a division into groups and genera. The Agarics proper, in which the hymenium is closely connected with the tissue which supports it, fall readily into five groups according to the color of their spores, which are white, pinkish or salmon-color, rusty-brown or ochraceous, dark or purplish brown, and black. Each of these groups is divided into genera (called subgenera by Fries, who placed all five groups under one genus, *Agaricus*) by differences in gross and minute structure. For example, among the white-spored genera (*Leucospori*) *Amanita* is known by its volva; *Lepiota* by its ring and free[1] gills, *Armillaria* by its ring and adnate[1] gills, *Tricholoma* by practical absence of veil and by sinuate[1] gills, *Clitocybe* by decurrent[1] gills, *Collybia* by the involute margin of the young pileus and by a cartilaginous stem, and so on through the list. With the pink spored Agarics (*Hyporhodii*) we run through the same category of structural differences, *Volvaria* corresponding to Amanita, *Entoloma* to Tricholoma, and so on; and the same thing may be said of the rusty brown spored (*Dermini*), the dark brown spored (*Pratelli*), and the black spored (*Coprinarii*), although in the last three groups by no means all types of structural difference are represented. To avoid possible confusion in nomenclature, it should be said that since the subgenera of Fries's original genus Agaricus have been raised to generic value, the old name *Agaricus* formerly given to each species has been retained only for the species of Fries's subgenus *Psalliota*. Hence what old-fashioned writers call *Agaricus muscarius*, *A. procerus*, *A. equestris*, *A. sinuatus*, etc., are now known, respectively, as *Amanita muscaria*, *Lepiota procera*, *Tricholoma equestre*, and *Entoloma sinuatum*.

Still other genera not included by Fries in the old genus Agaricus are included by Saccardo, and after him by Massee and others, with the genera already mentioned under four groups, divided according to spore color. Among these genera are *Cortinarius*, distinguished by its arachnoid veil; *Coprinus*, which deliquesces to an inky liquid; *Cantharellus*, with gills like swollen veins; *Lactarius*, with milky juice; *Lentinus*, with tough substance and serrate gills; and others.

[1] The significance of these and other terms was made clear by lantern slides.

In concluding I present to you the portrait of the revered Swedish mycologist, Elias Fries, who first introduced logical order into the systematic arrangement of mushrooms. After a life devoted to botany, and principally to mycology, he died in 1878 leaving all subsequent students of his chosen field everlastingly indebted to him. The portrait is taken from the second volume of his classical "Icones," or illustrations of mushrooms, which, together with his earlier work on the edible and poisonous species of Sweden, may be seen in the library of the Massachusetts Horticultural Society.

Hoping that this brief exposition in connection with the figures that you have seen may have cleared the ground a little, I refer you for more detailed information to the many good books upon the subject, and particularly to the mushrooms themselves.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 23, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following paper was read by the author:

THE CHRYSANTHEMUM: ITS PAST, PRESENT, AND FUTURE.

By EDMUND M. WOOD, Natick, Mass.

I have the honor, and most assuredly the pleasure, of addressing you upon a subject dear to us all, if for no other reason than that it is a part and parcel of "the means by which we live." The Chrysanthemum has, not inaptly, been termed "the Queen of the Autumn," and it is certainly, as it well deserves to be, one of (if not altogether) the most popular of autumn flowers, a special reservation being made at all seasons for the incomparable and unexcelled Rose.

A famous Irish poet, William Allingham, thus sings:

> "The rustic family of ox-eyes claim
> A royal cousin clad in purple and gold,
> Pearl, ruby, fleecy colors, such as fold
> The couching sun, and with a lofty name
> Chrysanthemum, — appearing bright and bold
> To startle poor November with a flame

Of sumptuous flowerage, making Summer tame,
And flush with Eastern pomp the dark and cold.
Voyager from Japan and broad Cathay,
The slant-eyed yellow people love thee much:
(All humans love a flower) and know the way
To fix their garden favorite with fine touch
In shapes of art. How joyful we to clutch
Their gifts! — but shall we clasp their hands one day?"

Mr. B. C. Ravenscroft, in his treatise on the Chrysanthemum, published in London in 1894, speaks of the popularity of the flower in England. He says that "from the date of the first Chrysanthemum show held in England in 1830, it has steadily advanced, not only in popularity, but in the size and beauty of the flowers as well, and above all in the number of new varieties constantly being introduced. As a matter of fact, more 'novelties' are now being raised and sent out annually than the entire list would number but a very few years ago. Several years have now elapsed since it was the opinion of many horticulturists (myself among the number) that the Chrysanthemum 'craze' was already on the wane; but the event proved the idea to be altogether erroneous. On the contrary, the flower has since become vastly more popular, and is now cultivated in much larger numbers and to greater perfection than ever." Our own experience here in the United States is but a counterpart of that in the mother country.

Mr. Ravenscroft says further, and very justly, that "the secret of the extraordinary popularity of the Chrysanthemum is probably to be found in its unprecedentedly accommodating character, combined with its great utility, not only for exhibition and ordinary decorative purposes, but for supplying flowers for cutting, etc.; while the fact of its natural season of flowering being the autumn and early winter, when flowers generally are much scarcer than at any other season, is doubtless a strong point in its favor. The culture of the plant, at least to a moderate degree of excellence, is also extremely simple, though this can scarcely be said of the production of blossoms for exhibition of the degree of perfection that is required at the present day; while the season for flowering is a long one, and may be extended to more than half of the year.

"The Chrysanthemum is indeed vigorous, free-rooting, and

floriferous to a quite unusual degree, and is, moreover, easily and rapidly propagated with the simplest appliances.

"Again, it is an almost, if not quite, hardy subject: and though a slight amount of artificial heat is at times necessary or desirable, yet it is quite possible to cultivate even the fine show varieties successfully up to a certain point without the aid of any heating apparatus whatever.

"In form, size, and color the flowers are also extremely varied, and for the most part artistic, lacking entirely the stiffness and formality of the Camellia and several other flowers; in size they vary from the tiny pompone, one inch across, to the huge Japanese blossom, one foot or more in diameter; while the range of coloring is also exceedingly large, and the hues for the most part are very rich and soft, if not exactly brilliant. Without doubt, the introduction, or rather development, of the large-flowered Japanese varieties, with their fantastic and endlessly varied forms, and rich, æsthetic coloring, has done much to popularize the plant. One has only to compare the general appearance of a stand of twelve or twenty-four of even the finest incurved varieties with an equal number of Japanese flowers, to appreciate the great superiority, from a decorative point of view, of the latter; while the plants themselves are, on the whole, of a decidedly more robust and vigorous constitution, and consequently more readily cultivated than the formerly more favored incurves."

One more advantage possessed by the Chrysanthemum is that, unlike the Rose, it evinces very little objection to a smoky atmosphere, and may be cultivated almost as successfully in the heart of a city or large town as in the purer air and under the clearer skies of a country spot. As a proof of this, I deem it only necessary to refer to the remarkable showing of Chrysanthemums found in the Temple Gardens, in the very midst of the smoke and the black fog of London. But to produce this result, intelligence and a thorough knowledge of the gardener's art are a prime necessity.

"As cut flowers Chrysanthemums are unsurpassed, if equalled. The colors are admirably suited for all decorative purposes, while the blossoms not only pack and travel better than those of most other subjects, but they also retain their freshness for a long time when placed in water, often, in a cool and dry atmosphere, for some weeks."

The Chrysanthemum, by which is meant our present race of autumn-flowering hybrids, is descended from two original species only, namely: *C. Indicum* and *C. Sinense.* It is in reality a half-hardy undershrub, for the stems, which towards the end of a single season's growth assume a woody nature, if not exposed to more than a few degrees of frost, retain their vitality, to some extent at least, and, under such conditions, frequently break into fresh growth some distance above the base. But in an inhospitable climate like ours, the stems would be invariably killed back to the ground each winter, and thus become annual merely, while the plant itself assumes the character of a herbaceous perennial. The roots, especially those of the finer, large flowering or "show" kinds, if left in the open ground, would be killed outright during a severe winter, and the more effectually should the soil be damp, heavy, or cold.

Here let me say that a Chrysanthemum with small yellow flowers grew in the Apothecaries' Botanic Garden at Chelsea, in England, in 1764; but the first of the large-flowered varieties was received at the Royal Gardens at Kew, and blossomed in 1764, and it is from this latter that the centennial introduction of the flower into England dates.

The first English seedlings of the Chrysanthemum were raised in 1835; and the first Chrysanthemum exhibition in England was held in 1843 at Norwich, and this was soon followed by the Society at Stoke Newington, now known as the National Chrysanthemum Society.

A new era in the history of this plant opened in England in 1847, by the introduction of the Pompon. In 1843, at the close of the war with China, Mr. Robert Fortune was sent out to that country by the London Horticultural Society to collect rare plants, and one of the curiosities he fell in with was the Chusan Daisy; and this and another small flower from the same source were the parents of the tribe known, from their resemblance to a rosette, as Pompons.

Still later, in 1860–62, Mr. Fortune made more discoveries at the town of Ak-sax-saw in Japan. He describes this town of Ak-sax-saw as the most famous place near Yeddo for the variety and beauty of the Chrysanthemums, some of which were in form and coloring quite distinct from any then known in Europe. "If," he said, "I can succeed in introducing these varieties into

Europe, they may create as great a change among Chrysanthemums as my Chusan Daisy did when she became the parent of the present race of Pompons." They were taken up in England, proved successful, and from them sprang those marvellous flowers which it is the pride of all you gentlemen to present yearly at the notable exhibition of our Massachusetts Horticultural Society.

And speaking of our own exhibition, I am reminded of the fact that in Japan every year a special imperial garden party is given in the palace grounds at Yeddo, in honor of this national flower of Japan; and at this, which may be termed the leading show of the world, some of the plants display not less than from three hundred and seventy-five to four hundred and fifty fully developed blossoms, growing upon a single specimen at a time.

The Chrysanthemum has been known in the United States for quite a number of years, but as to its early history here not much is to be gleaned, while as to its career in other countries we are left completely in the dark, with the exception of France. Mr. Dale, for some time the gardener to the honorable Society of the Middle Temple, in London, says of the Chrysanthemum, that "in the early part of the present century it was one of the most popular flowers of England, and, further, that after a period of comparative neglect it has again been admitted to a place in the list of the florists' flowers" — a circumstance in which I am quite sure that all of us rejoice. Indeed, Mr. Dale was so much impressed with the beauty of these extraordinary flowers that he tells us that from the necessity of his having to produce a display of flowers during the greater part of the month of November, his attention was especially directed to the Chrysanthemum as the only one suitable to his purpose.

The Chrysanthemum derives its name from two Greek words, *chrysos* (gold) and *anthos* (flower), and belongs to the natural order Compositæ, and in the Linnæan classification of plants we find it in the class *Syngenesia* and order *Polygamia Superflua*. Its flowers consist of four varieties, namely, Incurved, Reflexed, Japanese, and Anemone flowered. Incurved flowers approach the nearest to what florists consider as the true standard of perfection. Reflexed flowers, though not so good, are by no means to be held in disdain. The Japanese vary very much both in color and the conformation of the flowers, and are most invaluable for conser-

vatory decoration, remaining longer in bloom, and extending oft-times to "January's front severe."

Among Chrysanthemums the Japanese class stands foremost because of its great size, richness of coloring, and the general effectiveness of its flowers; and it is beyond all question the most popular and useful of all classes. The flowers vary greatly in form, and, with perhaps some few exceptions, the plants are of vigorous growth, with broad foliage, stout stems, and large flowers; and it may be that they are more easily grown than any of the other classes.

The Incurved class produces flowers whose petals are bent inward toward the points, presenting the appearance of a more or less perfect ball or sphere. It was the first distinct class obtained, and although it is very beautiful, the blossoms in the mass are not so thoroughly effective as the Japanese, lacking, as they do, the richness and great variety of the coloring. They are, also, more delicate, and certainly more troublesome to manage, than are the Japanese.

In the Reflexed class the flowers are not as large and showy as in some others, yet they are beautifully formed. The petals are reflexed or curved downwards, and overlap each other with the greatest regularity, and the coloring is very soft, delicate, and rich. The whole class are excellent growers, the plants bushy and branching, and they are most prolific in blossoms. They are splendidly adapted to open-air culture.

Of most of the Pompon class, as you all well know, the flowers in general are insignificant in size, although some, which are known as "Hybrid Pompons," are comparatively large.

The early, or what may be known as the summer-flowering, Chrysanthemums form a somewhat varied, but none the less a most useful class. The blossoms of several of the earliest flowering group are no larger than those of the smallest Pompons, while their growth is but very little more than a foot in height. From these the flowers range in size up to those of Madame Desgrange, William Holmes, etc., which are only slightly smaller than some of the Japanese flowers, and the plants increase up to three feet or four feet in height. As a result of hybridization between the two classes the early-flowering kinds run quite imperceptibly into the Japanese, the connecting links being found in such varieties as Madame Desgrange and its sports; Mlle.

Lacroix, Lady Selborne, P. van Geert, etc. The first named, with its sports, G. Wermiz (primrose) and Mrs. Hawkins (deep gold), form a beautiful and most useful group, admirably adapted alike for indoor decoration and for culture in the open air; and a great future is in store for this most excellent and attractive group.

Having thus briefly, and much to my regret imperfectly, sketched the history and peculiarities of this most charming flower, let us take a glance at the methods of its cultivation.

Mr. Edwin Molyneux, gardener to W. H. Myers, Esq., of Swanmore Park, Bishop's Waltham, England, may be looked upon as an expert in all that appertains to the Chrysanthemum, and he "regards a favorable start as being necessary to a successful finish. The foundation must be thoroughly laid to insure that success which all should strive to attain who engage in the cultivation of this flower." Mr. Molyneux speaks *ex cathedra*, for during a period of six years he won eighty-six prizes, and of these no less than seventy-four were firsts. Moreover, these prizes were won in competition with the best growers of the day at the leading shows in the south of England; and the Swanmore blooms were placed first during four consecutive years in the great cup class at Kingston-on-Thames — a feat unparalleled in the annals of Chrysanthemum showing, and never approached since. Mr. Molyneux deserved to be crowned King of Chrysanthemum growers and exhibitors.

And here allow me to suggest a fact with which no doubt you are all quite familiar, that within a radius of ninety miles of Boston the Chrysanthemum is grown to a perfection nowhere excelled in this or any other country.

The cultivation of the Chrysanthemum for blooms for the market and single specimens for exhibition is attended with much more care and labor than any other branch of the Chrysanthemum raising industry; and the fact remains that the culture of the flower, for exhibition alone, has now been elevated to the dignity of a fine art, or rather to that of an almost exact science, and those who desire to win in the future must do not only all that men who have made the subject a special study of a large part of a lifetime have done in the past, and can do at the present time, but a little more than that, and, if among the possibilities, much better, also.

Growing for exhibitions is a most arduous task — the most

arduous, perhaps, that falls to the lot of the Chrysanthemum raiser, with the single exception of raising new varieties from seed. Exhibiting at the present day is by no means what it has been in the past, and the gaining of prizes has become a really difficult feat. Judging is more minute and more intelligent than it was in bygone days. It is now performed almost exclusively by points, and in order that a sufficient number of these points may be secured, untold minutiæ must be most closely observed, otherwise the cultivator, to use a homely, but yet most applicable phrase, "will not be in it." The only way to succeed in these days is to acquaint one's self thoroughly with the details of cultivation as practised by the best growers, and then by some fortuitous combination of circumstances to discover a way by which a better method, no matter how slight, may be attained. In all cases, however, constant and unremitting attention must be bestowed upon the plants from the time the cuttings have been first inserted, until the flowers have been placed upon exhibition and the prize won.

There is one fact that it is well to bear constantly in mind, and that is, that it is absolutely useless to attempt to grow plants or blooms for exhibition, unless they have your constant attention. To give them an occasional attendance, or even but once a day, is in itself a suicidal act. As eternal vigilance is the price of liberty, so unremitting attention is the price of success, so far as the Chrysanthemum is concerned. It is a plant that possesses a most voracious appetite, and it requires to be fed with as much regularity, and as much care, as a suckling infant. It is dainty in its food, and it is a gourmand as well as a gourmet. It requires plenty to eat and drink, and of the very best the market affords. It must be fed upon the very best soils, manures, etc., and its drink must not be alone "the crystal well," but rich liquids and plenty of them, and withal, like the human system, it must breathe a sufficient supply of fresh, wholesome, and life-giving air. Proper drainage is an essential requisite, in order to insure that the plants, as is sometimes said of an unfortunate ship, shall not become "water-logged." Cleanliness is next to godliness in the plant, as well as in the man, and therefore the intelligent grower will see to it that his plants have a clean habitation. Never use a dirty pot. The pots, or the long boxes in which the plants may be raised, should be perfectly clean. Now

this, on the surface, appears to be a trivial matter, but in reality much depends upon it. Test it, and you will find that in turning plants out of pots that were dirty when used, the roots cling so tenaciously to the sides that many are broken in the act of removing them. This does not occur if the pots are clean, but the plants may be shifted with their roots intact, and will not undergo the slightest check from the operation.

In the cultivation of the Chrysanthemum do not attempt too many varieties:

> "The friends thou hast, and their adoption tried,
> Grapple them to thy soul with hooks of steel;
> But do not dull thy palm with entertainment
> Of each new-hatch'd, unfledg'd comrade."

An eminent English authority said on this matter of novelties, "I venture to say that quite three parts of the new sorts sent out in such glowing terms are not equal in merit to many of the older varieties. No little disappointment has been caused by purchasing all the new varieties, which were expected to produce wonderful flowers. Instead of this it has often been found that time and space have not been well occupied in growing them. Far better is it to grow an extra number of plants of those varieties which experience has proved can be depended upon as certain producers of first-class flowers under first-class culture, than for a grower with limited experience, money, and space to overburden himself with so-called 'novelties.'"

Every grower of the Chrysanthemum is well aware that it has a tendency to "sport;" that is, a plant that has always yielded flowers of a certain color produces others of a different hue — yellow, for instance, giving out bronze or orange. There are instances when the whole of a plant will thus throw different colored blossoms, but as a rule they are only to be found on one branch. Many of these "sports" when "fixed" are improvements upon older kinds. Cuttings taken from the branch or part of the plant which "sports" will usually produce flowers of the same color again. If they and the plants raised in turn from them continue to do so, and the departure becomes a permanency, the sport is said to be "fixed;" and if this fresh break is of a new or desirable hue and character, or in any manner an improvement upon existing forms, it receives a name, is propagated, and introduced into the market. There are occasions, however, when

a sport will sooner or later revert to the original color, and, as a matter of course, it becomes worthless.

There is no earthly reason why a new variety obtained from a sport is not, to the full, as good as one obtained from seed. Many forms of the incurved class have been procured in this manner. It may be said that the general system of growing Chrysanthemums for the sole production of large blooms is not favorable for increasing the number of new varieties by sports, on the ground that the plants are denuded of the side shoots as they grow, and it is from these very side shoots, when they are permitted to develop themselves into flowers, that the largest number of sports are obtained. In the Japanese class the fewest sports are found. With scarcely an exception all sports are the counterparts, in foliage and habit, of their parents; and there cannot be the least doubt that some of them possess better constitutions and produce finer flowers than their originals, or that they are, in some respects, improvements upon their parents.

The Seedling Chrysanthemum is not "like angels' visits, few and far between," but on the contrary, it is the rule and not the exception. Save a comparatively small number of sports, all the varieties of the Chrysanthemum that are in cultivation have been raised from seed at one period or another; and it is of course only in this manner that really new and distinct kinds are to be obtained. It is regarded as a curious fact that in England, where the growing of the flower is second only to that of China and Japan, for many years past, and until quite recently, few, if indeed any, attempts have been made to raise new seedling plants, although in the early days of its cultivation a number of what were then considered remarkably fine varieties were obtained from seed. Owing to the damp and unfavorable conditions of the English autumns, so much difficulty was experienced in ripening the seeds that the attempt was relinquished, and nearly all the novelties displayed in that country were obtained from raisers in Japan and France, with a few from the islands of Jersey and Guernsey; and the confession is made that in recent years, we Americans have taken up the industry with such great zeal and energy that we have supplied to the mother-country several hundred of more or less fine and valuable introductions with stronger constitutions, thus enabling seed of the Chrysanthemum to be again grown in England.

Within the last three or four years fresh attempts have been made in this direction in England, and they have not only resulted in some really surprising successes, but they have demonstrated the fact that in the damp, smoky, and humid climate of England, well ripened seed can be produced with considerable certainty from American varieties, and that such seed, if saved with care, will afford a large proportion of varieties fully the equals, and in many respects the superiors, to the bulk of those imported from other countries.

In the raising of plants beware of their enemies. That they have enemies is beyond all question. Chief of these are dampness and pestiferous insects. The first is easily overcome by the simple application of moderate heat constantly passing over and around the plants; but the second is not so readily vanquished, especially if permitted to become numerous upon the plants. Then it is that

> "Diseases desperate grown,
> By desperate appliance are relieved, or not at all."

The one great disease to which the Chrysanthemum is liable is mildew. It appears in the form of a white, woolly-looking growth, mostly on the under sides of the leaves. In its nature it is a fungus, and in a close atmosphere it spreads rapidly, and sadly impairs the functions of the foliage. The simplest and it may be the best remedy is sulphur, and if this is applied in time it will generally check, if not immediately cure, an attack.

One of the best qualities which this flower possesses is the long time the blooms remain fresh, either growing on the plants or in a cut state; still, greatly to the disappointment of many growers for exhibition, they ofttimes fail to keep long enough; and thus a large number of fine blooms are rendered useless through the too early development of some of the varieties. As to the cut blooms intended for exhibition, there is in reality no royal road to success with regard to their perfect preservation for a greater or less period. Much of this success will depend on good luck and the state in which the blooms were when cut from the plants; and if they should remain in such complete condition as to gain you the prize at the exhibition, thank the blind goddess Fortune therefor.

It is an undisputed fact that there is much misunderstanding

among growers of the Chrysanthemum, as to what qualities do in reality constitute a good bloom. Size is the first object a cultivator has in view, but this in itself is not enough, and must be accompanied by other good points before the flower can take rank as a first-class specimen. These several points or qualities may be set down as size, depth, solidity, breadth of petals, form, finish of flower and foliage, freshness, and most certainly color. I do not know as there is any absolute size to which the various classes of the Chrysanthemum may be grown at the present day, or to what perfection it may attain in the future; but this I feel well assured of — given the qualifications of depth, solidity, breadth of petal, form, finish, freshness, and color, then the larger the size to which you can bring it, the greater the prospect of carrying off the much coveted prize.

Here permit me to say that the rage for this unquestioned and unquestionably charming flower being still on the increase and its capabilities to all appearances being inexhaustible, a most inviting and remunerative field is opened up for the energies of all those who have the means, time, and patience to embark in its culture.

The folklore of the Chrysanthemum is very limited, and is confined to China and Japan. In the former country there is a proverbial rhyme connected with it, which may be translated as follows:

> "In the second month the Peach tree blooms,
> But not until the ninth the Chrysanthemums;
> So each must wait till his own time comes,"

which, as I take it, is a somewhat refined way of saying "every dog has his day," and so the charming English poet, Henry Kirk White, sings:

> "Say, what retards, amid the summer's blaze,
> The autumnal flower, till pale declining days?
> The God of Seasons, whose pervading power
> Controls the sun, or sheds the fleecy shower;
> He bids each flower His quickening word obey,
> Or to each lingering bloom enjoins delay."

The Japanese have a fancy that the dewy juices in the heart of the Chrysanthemum are the "Elixir of Life."

The poets, in a great measure, have paid little if any attention

to the Chrysanthemum, but appear to have expended nearly all their genius on the well-deserving rose, and other flowers.

Here is a translation of a poem, by Satoni Sensei, a native Japanese:

"O bloom of Chrysanthemum,
Fabled of old,
A fountain of rapture
And sweetness untold —
The dewy wine sparkled
With life in its flame,
And mortals partaking
Immortal became.
But lo! There hath opened
A wonderful flower,
For God's love hath blossomed —
Soul life in its dower,
And its petals shall shine
More endearing than thine,
With their fabulous treasures of life-giving wine, —
Far fairyland's store, —
And its dewdrops shall glow,
And its fragrance shall grow
From more unto more
While the years come and go."

We are indebted to Dr. Walcott, of Cambridge, and Mr. W. K. Harris, of Philadelphia, who were pioneers in fertilization of the flowers in this country, for varieties which they have produced. They were instrumental in creating a wide interest in the flowers. Later Mr. Thomas H. Spaulding, of New Jersey, and Mr. E. G. Hill, of Richmond, Indiana, took up the cultivation.

There is one thing to which I wish to call the special attention of your Society, that it may, I trust, be abandoned: it is the unsightly staking of Chrysanthemum plants with willow and other stakes, reminding one of a cripple supported on crutches. They have neither grace, finish, nor even presentable foliage, or flowers with either form or coloring. If judged by a correct standard of coloring and finish or foliage, all would be condemned, and relegated to the rear. While the late exhibit showed wonderful specimens of single flowers, the plant exhibit was anything but creditable as compared with the cut blooms. I trust that the coming season plants will be judged by a standard of blooms, by finish and luxuriance of foliage, by the form and color of bloom,

and that the plant shall exhibit only its flowers and foliage, and not a forest of unsightly sticks supporting a weak stem with little or no foliage, and colorless flowers.

I agree with the writer who said the nomenclature of the Chrysanthemum has not been much improved. Nearly all the names are of private persons, which, of course, to the great mass of people are as arbitrary and meaningless as "S.T.1860X," or any other cabalistic combination, and yet there is always the possibility in the case of every variety of Chrysanthemum of a perfectly happy and descriptive name. Here is a certain Chrysanthemum, for instance, with a great many riotous, rollicking red flowers growing upon it, scattering themselves about in a perfectly drunken way. There is one name that suggests itself instantly in connection with this flower: it ought to be called the Tam o' Shanter. Every bloom suggests the intoxicated Scotchman looking back in terror at the pursuing fiends. But what is the flower named? J. Collins. Tom Collins would have been better.

The first Chrysanthemum exhibit for prizes in this country was made at the Massachusetts Horticultural Society's Exhibition in 1861, and the prizes amounted to $17. In 1868 the exhibition was first styled the Chrysanthemum Show, and the prizes were increased to $55; this exhibition was an entire failure. Up to 1868 these shows were on Saturdays, from 12 to 3 P.M., but in 1879 it was held on Wednesday, from 12 M. to 10 P.M. In 1882 the prizes amounted to $121. Though planned for one day, it was kept open two days on account of the excellence of the exhibit and the interest taken therein. It continued in this manner each year until 1886. The prizes were increased, and in 1887 amounted to $741, and in 1896 to $1,200, the exhibit lasting nearly the entire week.

It will be observed that interest in the Chrysanthemum has steadily increased year after year until the last season, when the Exhibition of the Massachusetts Horticultural Society exceeded all previous ones in beauty, size, finish, and coloring of the flowers — and even surpassed the expectation of the most ardent admirer of the beautiful Queen of Autumn, excelling all exhibits in the United States, and, it is believed, not outdone in any part of the world. In the attainment of this grand result, the Massachusetts Horticultural Society can justly take a large share of credit, with its encouraging, generous spirit toward exhibitors, entries being

free to all. Boston may well feel a just pride in the efforts of the growers who have made it possible to give to us such a regal show as they did the past season.

To the public a debt of gratitude is also due. Nowhere in the world do the people pay, and willingly, so high a price for a fine Chrysanthemum as the residents of the great and good old city of Boston. It is these elements that contribute to bring about such grand results, which would be impossible but for them.

In drawing to a close, permit me to say that I regard the future of the Chrysanthemum as assured. The advances made in its improvement have added greatly to the grace and beauty of the flower, and popularized it until it has won a permanent abiding place in all hearts. It will, indeed, be a bold flower which will be able to displace it, or even disturb its queenly hold upon us. The public, in time to come, will undoubtedly require, for the embellishment of the home, flowers of a smaller type, but of equal finish and color with the larger and more regal varieties, yet both will hold their proper place, and will equally delight and gratify our taste for this most attractive flower.

At the present time we stand simply on the threshold of its future, great as its advance has been in the past decade only. We have a right to anticipate those improvements which technical schools of chemistry, electricity, and kindred science are sure to bring. There should be no hesitancy in pressing on. The goal of ultimate success is already in view, and when that is reached there can be no further doubt of the established value of the Chrysanthemum in a mercantile sense, while æsthetically in bringing it to its highest pitch of perfection and beauty you will have succeeded in making it a joy forever.

Discussion.

Kenneth Finlayson asked, How can we bring specimens here without staking?

Mr. Wood answered, By almost any method but that used heretofore; they can be trained to wire supports.

Mr. Finlayson still thought that they could not be brought here without staking.

Mr. Wood thought that wire frames would be effectual, but he had not looked into the subject.

Thomas Harrison spoke of training the plants in a pyramidal form.

In regard to the application of sulphur, Mr. Wood spoke of using it, sometimes directly and sometimes on steam-pipes.

Mr. Finlayson inquired of Mr. Wood whether he used any particular fertilizer. The answer was that he had not tested all, but uses sheep compost, compost from horned cattle, sulphate of ammonia, and nitrate of soda.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 30, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following is an abstract of the lecture given:

PLANT BEAUTY.

By HENRY T. BAILEY, Massachusetts State Supervisor of Drawing, Scituate.

There are different kinds of love for flowers. There is the scientific love; those who have only this seldom get the true message of the flowers. At the other extreme are people having a sentimental love for flowers; they pronounce their colors marvellous, and gush indiscriminately over their beauty. The third kind of love for flowers has a basis of intelligent appreciation. The greatest enjoyment is when scientific love is combined with a sympathetic appreciation of beauty.

Plant beauty is of two sorts, beauty of color and beauty of form. In some plants, like the calla, beauty of form predominates; in others, like the pæony, beauty of color; in still others, like the gladiolus, the lines of stalk, flower, and bud are as noticeably lovely as their colors. In the rose we have beauty both of form and color. Plants conspicuously beautiful for their form should not be gathered together in tight bouquets; each should be enjoyed by itself or with two or three companions so grouped in a vase or other receptacle that the beauty of the lines of each is enhanced by that of the others. Plants of lovely color, on the other hand, are more effective when massed. One snowball is insignificant; a bushel basket full of branches crowded

with the balls of creamy white glowing against the rich green of their foliage is highly effective. In the arrangement of flowers of beautiful form, we have much to learn from the Japanese.

The "Studio" for October and December, 1896, has suggestive articles, with more suggestive illustrations, of the fine art of flower arrangement as practised by the floral artists of the Sunrise Kingdom. Mr. Conder's book, "The Flowers of Japan and the Art of Floral Arrangement," to be found in the Library of this Society, will repay thoughtful study. Even the suggestions from Japanese prints, now so easily obtainable, are not to be despised by the wide-awake florist.

The chief element in beauty of form is curvature. Ruskin says there are two kinds of curves, the mortal and the immortal. We love immortal curves — the simple curve of force, the reversed curve of grace, and the spiral. The curve of force is shown in the sky-rocket. Water shot out of a fountain takes the same curve; so also does the stem of the golden-rod. Reversed curves and spirals are seen in the unfolding of a fern frond. [These were further illustrated by charts and blackboard sketches.]

Another element of beauty is radiation; either from a centre, as in a snowflake, or from some point outside the centre, as in a palm-leaf fan. The effect may be bi-symmetrical, as in a scallop shell, or balanced, as in a begonia leaf.

Our fathers preferred the bi-symmetrical arrangement. It appeared in the little tight headed bouquets brought to church, and in all manner of decoration. It was even supposed that houses must be bi-symmetrical — that is, that the two sides must not only balance each other, but must be uniform in shape; and inside the same bi-symmetrical arrangement was thought necessary, even to the placing of photographs and vases on the mantel.

The arrangement evidently preferred by nature is that of balance. This is illustrated by a leaf where the portion on one side of the mid-rib is smaller than the other, and perfect balance is secured by the curvature of the mid-rib and stem to the needy side. The Arethusa poised on its stem is another fine illustration. Balance may be seen illustrated in the lines of the hand. It controls the position of the leaflets of the rose and sumach. The Maine woodsmen know that trees are so balanced that if but an inch of wood is left under the centre the tree will stand. A stem of grass shows the balance of parts which make it self-sup-

porting. The grouping of plants or sprays is to be governed by the law of balance.

Beautiful color has such qualities as purity, gradation, and depth, and when colored flowers are massed, harmonious relations of the different hues should be secured.

All color comes from the sun. The standard colors are red, orange, yellow, green, blue, and violet. The first quality in color is purity. Color must not be muddy, as is often seen in novel varieties of pansies.

There are five typical color groups or harmonies. The first may be called a contrasted harmony. All green-leaved plants with white flowers are in this group. The second is dominant harmony, produced by combining tints and shades of one color, as, for example, a head of hyacinths or a bunch of double violet asters with no green foliage in sight. This combination of tints and shades, so common in the decorative arts and in dress goods, is rarely found in nature, and is least satisfactory as a harmony. The third is analogous harmony, composed of related hues of color. All green-leaved plants with yellow flowers are in this group. A bunch of gladioli tinted with violet-red, crimson, rose, scarlet, and salmon forms an analogous harmony of exquisite beauty. The fourth is complementary harmony — a harmony brought about by the juxtaposition of complementary colors. A violet red camellia seen against its glossy green leaves is a complementary harmony; so, also, is a bunch of violets with their yellow-green leaves. Another beautiful example is the marsh St. John's-wort, the leaves of which are green-blue, with a thick bloom, while the flowers are an orange tint, thus giving two complementary colors. The rocks at the seashore are in the orange scale, and the water being in effect a green-blue we have complementary harmony. Inland the rocks are covered with lichens of gray color, to contrast with the grass. The crags of the Alps are orange, from the orange-colored lichens growing there, making a tone complementary to the color of the sky. Such facts seem to prove that the Almighty who made these colors loves harmony. "He hath made everything beautiful in its time."

The fifth is perfected harmony: a color group composed of analogous hues combined with a color complementary to the general effect of all the group. For example, the gladioli form-

ing an analogous harmony if placed against a background of old ampelopsis leaves, of rich, bluish-green color, would be greatly enhanced in color effect, and the whole would form a perfected harmony. A bowl full of pansies is in perfected harmony. The analogous group runs through varying hues, from pure yellow in the flower centres to the yellowish-green of the foliage. The complementary to the effect of this group is to be seen in the rich purple of the petals. [Charts, diagrams, and bouquets of flowers were used to make this clear. The complementary and analogous colors were illustrated by means of the Bradley color wheel.]

The American people are becoming more sensitive to beauty every year. The florists who furnish flowers to decorate their homes and halls can do much to elevate public taste. A really beautiful thing is always attractive. What was true for Emerson is true for us all. Speaking of beauty he said:

> "When first my eyes saw thee
> I found me thy thrall."

It costs no more to make a beautiful bouquet than to make an ugly one, and ultimately he who produces beauty gives the greater pleasure and receives the larger reward.

MEETING FOR LECTURE AND DISCUSSION.

Saturday, February 13, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, Francis H. Appleton, in the chair.

The following paper was read by the author:

The Sweet Pea, the Flower for Everybody.

By Rev. W. T. Hutchins, Indian Orchard, Mass.

It is simply impossible that either the commercial or the popular interest in floriculture should decrease. In such a country as ours it must not only increase, but for some time to come the very ratio of this cumulative growth of interest must increase. The demand for florists' stock, the seed patronage, the organization of floral societies, and the popularizing of exhibitions, — we see all these increasing with phenomenal rapidity. Indeed, more

remarkable than all these is the wonderful progress made in the past ten years in evolving improved forms and multiplied varieties in many of our garden favorites. Our country is still in but the infancy of its floral development.

It is easy of course to glut the market and make it appear that the florist's and the seedman's business is overdone. But a whole continent of educational work is before us, in which men, women, and children are to awake to the floral needs and joys of their nature. We have not begun to put the art of floriculture where it belongs — in the very van of the finest arts. The arts of painting, drawing, and sculpture long ago attained the dignity of having schools, and masters, and pupils without number, and a splendid patronage. The musical arts are on a basis of careful training, and our admission to civilized society almost depends on our either being musicians of some sort or having an educated appreciation of music. These things have asserted their right to the name of "art," and to universal recognition. But floriculture is in its undeveloped stage. It is still little more than a voice in our nature crying for attention. It has won as yet from people generally only enough response to prove that it is destined to become an art of arts for our universal pleasure and profit. The "fine arts" are indoor arts, and since one-half our life is spent indoors the refinement of society has been shaped accordingly into the arts of the parlor and the drawing-room. But our Creator turns us outdoors for the other half of the year, and here in this country we are only learning how to use our summer leisure, and in what direction to look for outdoor pleasure. Our American life is being redeemed from a state of grinding toil. We have largely passed the pioneer stage of hard grubbing for a living. As fast as we get above the level of a precarious livelihood we have time coming back on our hands, or at least can afford to take time for healthful and enjoyable diversion. Home may mean a bed, a table, and a roof, at first, but as surely as we prosper home comes to mean things beautiful within and without. A well-kept lawn and blooming garden are inevitably in the line of our mental and social development, and we get them at about the same time that we have means, leisure, and appetite to devote to these things.

Some very interesting conclusions in this direction might be drawn from the multitude of letters I receive from men of all

professions. The time has gone by when floriculture was an effeminate diversion. Of course when virile men are busy opening a continent to commerce, and wrestling with the stern pioneer facts that dispute every inch of a man's progress towards success in any business, they are not thinking about posy beds; but as surely as a refined and intelligent man gets beyond the critical stage of his business or professional development, the tastes of his mind will come to the surface and he will yield to the sweet seduction of such diversions as have restful pleasure in them; and, speaking for this mundane world, the very man who is running under the highest pressure of business is the man who must yield to the enticement of some pleasant hobby or speedily terminate his suicidal career. I do a good deal of floral preaching outside the pupit, for I consider that there is no higher humanitarian mission than to persuade men to wed some hobby that shall make them absolutely forget their daily vocation for an hour or for a half-day. I will challenge any man to find an avocation that will more restfully exercise and at the same time divert body, mind, and spirit than some special line of floriculture.

A short time ago floriculture was what it was to your dear old grandmother, a medley of confused flowers. But a new era in floriculture has dawned. Life is now too short to master even one flower as we have come to understand it. A man deserves to be knighted who takes some sweet floral nymph of the woods, or some old-fashioned favorite of our childhood garden, and makes a royal family of it, unlocking the mysterious colors that are hidden in its pale bosom, and turning one modest little Cinderella into a hundred queens of beauty and proud grace. What Mr. Eckford has done for the Sweet Pea, a score of other consecrated noblemen have done for other flowers. The time has not come to canonize these men. They have come through the humble walk of being some rich man's gardener, or they are down on their knees in communion with the soil, wearing the poor man's clothes, earning the pittance of a struggling florist, happy if some lady will pay the cheap price of a nosegay. But if you will believe it they are ushering in the day when floriculture will be the queen of arts, and when men of the proudest ambition and intelligence will aspire to have their names associated in monumental remembrance with the development of some flower. We

have carried nothing to perfection yet. One by one the flowers that have great possibilities in them make their advent into this new era. They have only made their graceful bow to us. You have only begun to know a flower when you see it as it is. You must have the prophetic anointing and see it as it is to be.

I felt deeply touched as I went into the dwarf canna house at the Royal Horticultural trial gardens with Mr. Eckford and heard him, as he stood before the flaming cannas, say he would like to begin life over again and devote himself to them. It was the soul of this old florist, who is through his work, that looked into the future of the dwarf canna and saw the vision of its coming glory. To see a flower with the heavenly eye, and love it with the heavenly heart, is to drink in its full prophecy, and it is that which consecrates the florist and lifts his business above the slime of commerce to the ethereal purity and pleasure that God has hidden in his beautiful handiwork.

I know we are living in the football era, and men gravitate towards half-civilized and even brutal athletics, and call it pleasure; but floriculture is at the other end of man's development, and is both beautiful and manly.

I have tried to study one flower, but not a day passes when I do not blush because people write to me as if I knew something about that flower. I know enough now to know that I know almost nothing about it. I am in love with it — wedded to it — learning about it. I have put ten years of hard work on it, but it is too deep for me. I wonder if your roses and your carnations impress you that way. I am sure you have a man's work before you, to master the rose and the carnation. How wonderfully their increasing beauty rewards you, and yet keeps you humble. It is a grand thing to be occupied with something that rewards you with pure pleasure and at the same time gives you a humble estimate of yourself. That is the divine mission of floriculture. Take any flower you please — there is room enough for mental and spiritual expansion in any one, and your pride will have as many falls as there are days in the year. Pardon this ministerial digression.

Now let us take a little history of the Sweet Pea. So far as I can learn, François Cupani, an Italian botanist in Sicily, about 1700, was the first cultivator of this flower. There appear to have been four original varieties, two of them natives of Ceylon

and two of Sicily. Linnæus makes these four native sorts pretty plain. It is possible that there were but the two of which De Candolle speaks, the *purpureus* and the *roseus*, and that the other two are variations of these.

The *purpureus* must have been very nearly like our common light blue and purple of the trade, for this is perhaps the commonest "rogue" to which the new sorts revert. It comes into the growers' fields everywhere. Then the original of the old Painted Lady, the pretty pink and white that everybody loves, must have been the native Ceylon variety called *roseus*. But there was an original red sort, and it appears to have come from Sicily with the purple. The *roseus* from Ceylon seems to have varied from pink and white to white. Going back thirty years from today to the beginning of the work on the modern Sweet Pea, we find these four originals, which probably show but little change from 1700 to 1860. I suspect that these original sorts broke into red and purple striped a good while ago. Call them varieties, and as late, say, as 1860 there could only have been the original purple, red, pink and white, white and red striped, and purple striped. Indeed when you study the seed business you very quickly get from modern history into ancient, and even the length of one generation will take us into that dim past. But the last thirty years have been a revelation and an opening era.

The first note of improved work on the Sweet Pea that I have states that Brown of Sudbury, England, received a certificate on Invincible Scarlet in 1865. It was put out by Carter of London. Then in 1867 we find the first improvement on the original purple, being given the name Imperial Purple, and leading the way to the Black.

About this time it appears that Cattell, of Westerham, had worked on the red striped and put it out under the name of the Queen. The next step was the introduction of the Crown Princess of Prussia, the mother of light, flesh-pink Sweet Peas, by Haage & Schmidt, of Erfurt, about 1868. Later the Violet Queen, put out by Carter, and then the Butterfly, by Sutton, in 1878. Carter put out the names Invincible Black and Invincible Scarlet Striped about 1880. Soon followed Lilacina Splendens, now a doubtful variety, although we still have the name Splendid Lilac. I suspect this latter is what more commonly became the Captain Clarke. The next decided acquisition of color was

Adonis, put out by Carter about 1884. The name Dark Red is from Benary, of Erfurt, and was a development doubtless from the original red.

We come now to the history of the Sweet Pea of today. Henry Eckford, of Wem, Shropshire, England, started into the specializing of this flower about 1876, the earliest notice of his offering anything being 1882. Mr. Laxton, of Bedford, also started in this race. Exact dates are not easy to determine. Novelties are exhibited at the flower shows sometimes two or three years before their introduction to the trade. Bronze Prince was certificated to Mr. Eckford in 1882. Carmine Rose, put out by Hurst, was certificated in 1883. But Mr. Eckford has dropped out everything offered before 1885. His really creditable introductions began with this date to be offered in rapid succession. Names of his that he has ceased to list are Bronze Prince, Queen of the Isles (this is still listed by the trade, but not by Mr. Eckford), Miss Ethel (long since dropped), Mauve Queen (the name under which Countess of Radnor was first certificated).

A word here about Mr. Laxton's work, before speaking more particularly of Mr. Eckford's. Mr. Laxton's son told me that his father had made a large number of crosses in Sweet Pea work, but with little satisfaction. He introduced Invincible Carmine and Invincible Blue, but the Laxton varieties now of most decided merit, having some originality of color, are Etna and Madame Carnot, 1891, Carmen Sylva and Rising Sun, 1892, and Princess May, 1893.

And now for Mr. Eckford: "The Garden," of London, has just paid him the compliment of dedicating its fiftieth volume to him. Mr. Eckford is now seventy-four years old. I found him at his pleasant Wem home in apparent patriarchal vigor in the summer of 1895, but since then his health has been broken and his work is probably done. His son John Stainer Eckford will succeed to the business. "The Garden" recites the record of Mr. Eckford's service from 1839 to 1897 in the employ of various gentlemen of title and wealth. I will insert here this valuable record verbatim:

"Mr. Henry Eckford was born at Stonehouse, in the parish of Liberton, near Edinburgh, on May 17, 1823. In December, 1839, he was sent as an apprentice to the gardens of Lord Lovat, Beaufort Castle, Inverness, where he remained for three years. He

returned to Edinburgh and then went to New Liston, the seat of Mr. James Hogg. He subsequently was employed as foreman in the following gardens: Fingask Castle, Perthshire; Penicuick House, Midlothian; and Oxenford Castle. In the beginning of 1847 he arrived in London with a letter of introduction from Mr. McNab, of the Edinburgh Botanic Gardens, to Mr. Hugh Low, by whom he was sent as foreman in the gardens of Colonel Baker, of Salisbury, then under the management of Mr. Dodds, who will be remembered in connection with the improvement of the Dahlia and other florists' flowers. He remained here for two years, afterwards serving under Mr. Fleming in the gardens at Trentham, and going thence to Cane Wood, Highgate. In 1854 he was appointed head gardener to the Earl of Radnor at Coleshill, Berks, where during his stay of twenty years he raised many Dahlias, Pelargoniums, and Verbenas, which were for the most part sent out by the late Mr. Keynes, of Salisbury. In the year 1878, Dr. Sankey, who was an enthusiastic florist, invited Mr. Eckford to take charge of his gardens at Sandywell, Gloucester, with the view to raising seedlings of florists' flowers. At this time the improvement in Sweet Peas had not been thought of, and in 1879 he obtained the best varieties of edible Peas and various Sweet Peas. He soon set to work and raised many fine varieties of edible Peas which are a gain in our kitchen gardens at the present day.

"To him is due the great improvement that has been made in the Sweet Peas, these more particularly having had his special attention of late years, and visitors to the Royal Horticultural Society's meetings will remember the fine collections he has on many occasions exhibited there. The Sweet Pea is the most valuable of all annual flowers of the present day; its delicious perfume, its diversity of lovely colors, its lengthened succession of bloom, and its value for cutting entitle it to a place in every garden. It may be had in bloom for seven months in the year from one sowing if care be taken to pick off every flower as soon as it shows sign of fading, not letting any seed-pods form. In order to obtain the best results from Sweet Peas, Mr. Eckford sows very thinly, with the result that each plant branches out and forms quite a bush. If gardeners would only sow their Sweet Peas, and edible Peas as well, thinly in good soil, they

would be astonished at the results. By thin sowing we get fine flowers and in abundance.

"The work of Mr. Eckford with the Sweet Pea shows how much may be done with simple and often neglected things in our gardens. The Sweet Pea certainly was always one of the most valued of flowers, but now, with so many delicate and lovely hues, Sweet Peas are a garden of beauty. Who knows how many other things in our gardens may not have in them the germs of like improvement? Even some of the shrubs that now have only one aspect for us may some day show us a like variety. In any case we owe many charming things for our open-air gardens to Mr. Eckford, and wish him many happy years more of his charming and useful work."

You would easily take Mr. Eckford for a retired professional gentleman, his face and figure hardly betraying the years he has spent as a gardener, and in hand to hand contest with the soil. He has been a priest of nature, and has grown old gracefully by reason of the masterly profession of extorting from Nature her deeper secrets. Some of his best life's work has been on Primulas, Cinerarias, and Pansies, he having received as high as sixteen guineas an ounce for some seed. His trials of culinary Peas were a revelation to me. I shall never forget how one day he allowed two ladies to wander at will through the grounds, and one of them came exclaiming, "Oh, Mr. Eckford, Mrs. ——— found a pod with thirteen peas!" Mr. Eckford knew too well just where every specially fine pod was, and even to touch one in such a sacred place was more than his years of gracious courtesy could allow. It is a rare privilege to enter such a floral workshop, and the hedge about it is high, and the tall gates are well padlocked, and there is a sentinel near by. I was shown into Vilmorin's floral workshop just out of Paris, and the walls about it are like State's prison barriers. There are no jewels that can compare in value with tiny seeds, especially after twenty years of special work are locked up in such a seed. In 1893 one seed, by some inexplicable law, produced a dwarf Sweet Pea. In 1896 the world was supplied with the product of that one seed, and whatever the merit of "Cupid" was, it certainly illustrated the enterprise of a modern seed-house in multiplying and distributing the product of so small a thing as a single seed.

Coming back to Mr. Eckford's work, we owe Boston a debt for

leading the way to the popular interest in the Sweet Pea. Your annual Sweet Pea exhibit was already a regular thing and creditable before the rest of us saw anything very remarkable in them. I remember with what kindness Mr. Robert Farquhar first gave me Mr. Eckford's address, and I never forgot his wise injunction to use the confidence with due caution. I did so as long as I could, but the wave of Sweet Pea interest swept over the country, and I felt that the truly American thing was to help it on in every way. I suppose Boston has reaped its share of the profit coming from the sale of probably one hundred and fifty tons annually of Sweet Pea seed in this country. Seven years ago your catalogues were cautious about recommending the Eckford novelties, and well they might be, for to this day very few of the imported Eckford packets show up well the first year in our rigid New England climate and uncertain soil. You must have them if you keep up with the procession. Almost every seed of these imported packets does well on the Pacific coast, and American grown seed one year from Mr. Eckford's introduction is strong and shows us these novelties very nearly at their best. No one who is well up on the subject of this flower questions the remarkable merit of the finest Eckford novelties. And I believe we are to put such competitive interest into this flower that we shall hold Mr. Eckford's novelties up to their highest standard in size and quality. Canada seems to suit them well. From letters received it is evident that enthusiasm there is running high on Sweet Peas. And places along our northern border, sections also where they have a rich alluvial soil, up in the Northwest and the whole length of the Pacific coast, — in all these localities they can smile at the difficulty of growing the finest sorts, and giant blossoms are no fiction with them. I receive through the mail the pressed standards of blossoms measuring an inch and nine-sixteenths in width. When you have a blossom that exceeds an inch and a half, it looks like a hollyhock to an enthusiast. One grower is at work on a giant-flowered strain. Another writes me that he is developing a strain with five blossoms to a stem. By these signs I have ceased to be anxious about the retrograde of these fine things. We are going to have seed soon that is not spoiled by the jobbers' calculation to the quarter of a cent per pound on the quantity harvested per acre. Giant-flowered Sweet Peas are not made in that way, nor held up to the Eckford type.

Now we have just come into Mr. Eckford's finest work. He has gone very cautiously. He has the soul of a careful, painstaking, conservative florist. And he has been among aristocrats enough to become a dear old aristocrat himself. He has not had to beg any favors from the trade, and now he says, If you want this new set of advance novelties the price will be fifteen shillings whether you take one set or a thousand sets. Heretofore we have been one year behind on his novelties, but by paying the retail price they are open to us without any conditions. We are already at the point of Mr. Eckford's finest work on each color, and the time has come to sift the list of varieties thoroughly, and discard a large number of inferior sorts. We can now select a royal group, and hold them up to the finest grandiflora type. We can bring the number down to thirty. Mr. Eckford still has a rich treasure in his advance seedlings. He has a white that will surpass all previous white sorts. He has finer blue than we have yet seen. Doubtless a great quantity of cheap seed will be grown for our common trade, and at current prices little effort will be made to grow such stock for quality, and, since the great bulk of Sweet Peas are sold in mixed form, the cheap pound and packet trade will be satisfied with this field-grown stock.

A word about Mr. Eckford's gardens at Wem. It is a short, pleasant ride down from Liverpool past Chester and Whitchurch to the old-fashioned, huddled town of Wem. After a few minutes' walk outside the town along the English lanes you come to a high-hedged floral bower with high padlocked gates, through which you see the bright evidences of high-class gardening. Here is Mr. Eckford's floral workshop, five acres in extent, soon to be enlarged to take in four acres more.

Mr. Eckford does not grow his trade stock here. Indeed, his great perplexity is to get his novelties properly grown for the trade. Of late his trade stock has been grown down in Essex, a great seed section.

The most noticeable part of his Wem garden is two acres of what he calls his seedlings. In this he plants all his selections of seed, from the latest work, of every color. From this field of seedlings he selects such as he wishes to prepare for trade introduction. It was a rich treat to wander back and forth through those two acres of rows. They are all bushed enough to keep them off the

ground. At every step I could see improvement on all those varieties that have been offered to the trade. And the new and richer colorings extorted exclamations of pleasure. Mr. Eckford's keen eye detected at a distance the flashes of improved color, and his enthusiasm seemed unbounded. Now he says, "I don't get a shilling from all this two acres." Of course not! This field of seedlings is his treasure house, and must be carried along patiently year after year to make selections from. The new shadings run in all directions. At Wem, on the soil there found, and under the favorable conditions for color and size peculiar to the English climate, the blossoms attain a wonderful perfection. The vines were not remarkably thrifty, and there did not seem to be the abundant florescence that we have at times on this side the water, but every flower had the aristocratic look, as if some master hand had grown it. Delicate shadings, that will be lost under our extremes of sun and cold, are there developed to the finest degree. It is beautiful to read the language of color under those English conditions.

Mr. Eckford kept to himself all the secrets of his method of making these beautiful varieties, but the results of his work were abundant all about. In making up a new set of novelties, Mr. Eckford puts in about three or four of the highest grade sorts, and fills out with others not so highly developed. I would not complain if he doubled his price on the best sorts, and kept the others back.

As fast as he makes a selection for a new set, he plants a row of each for his own stock seed, and tones them up to the best type and then sends that seed to his grower to grow trade stock. We have been disappointed quite frequently in the results we get from the Eckford sealed packets, but the source of the difficulty has doubtless been in the poor growing of the Eckford seed stock after it leaves his hands. Certainly, as I saw the rows at Wem in preparation for seed, the blossoms were in every case of the highest quality, and true to description. The English conditions for growing seed of this flower do not compare with our Californian conditions. It requires two years of California growing to get back the Eckford quality of the novelties.

As Mr. Eckford has been the chief factor in giving us the improved Sweet Pea, so California is the second great factor in the growing of this flower. On the invitation of C. C. Morse & Co.,

of Santa Clara, California, I spent the month of May, 1894, with them. The chief point at that time was to set them right on the names and types of the already long list, so that all stocks might be thoroughly rogued. It seems but yesterday since we doubted whether Sweet Pea seed could be successfully grown in this country. But California is today supplying the best trade stock we have, and we are exporting this seed to the countries that but a few years ago were our sole dependence. Even two years ago none of the foreign growers were keeping up with Mr. Eckford's novelties, and were taking pains only to preserve the purity of color of the reliable sorts. As compared to a California grower, who, to fill any possible contract for every known variety, does not hesitate to plant two hundred and fifty acres of this one flower, the foreign growers can hardly be said to be in the market. California has a wonderful strength of soil, cool nights and warm days, and, the rainy season coming just after planting time, the root growth is excellent, and at harvest time they are sure to have continuous sunshine. Their chief danger is over-production. Messrs. Morse & Co. plant Sweet Peas about as we plant corn, two seeds in a place. Up to the first of June they can get in with a hoe, and to rogue out the "off" kinds, and after that the vines lock in together, and, with never a wind to beat them down, the whole field rises from three to five feet high, forming a mass of bloom, and going evenly to seed. Other growers plant them in rows about seven feet apart, and work among them all through the growing season. They are careful about saving seed stock. While rogueing them they are on the lookout for the finest plants producing the best blooms. These are marked with a stake, and saved for their own seed stock. Rogueing out off colors is only one-half what is needed. Deteriorated stock should be pulled up also, and nothing should be allowed to grow but plants fully up to the improved type. But our jobbers do not take this into consideration in fixing contract prices, and drive the grower into harvesting everything that will make weight. The California grower needs to bear in mind that if his stock is in the least deteriorated it will show in New England far more than in the rich soil of the Pacific coast. We must say this about our best California growers, that they are very enthusiastic about their Sweet Peas, and now they have reached the most interesting stage of their work — the making of novelties. With such a large acreage

to go over, they have a grand chance to find advance marks in size and quality and variations of color. The American novelties of next year will show real merit, for they are the first that they have obtained from hybridizing. Mr. Eckford's stock is now in a highly hybridized condition, and as they plant a large number of his packets they frequently break into new things, and by crossing his finest sorts they break up and show many of the grand advance novelties that Mr. Eckford has been holding back.

I shall be expected to refer to rules for the culture of this flower. Those who failed last year had plenty of good company. Only one of our Springfield enthusiasts succeeded well. Nothing comforted me more than to hear from Mr. J. F. C. Hyde that he too had joined the ranks of the unfortunate ones. The causes of failure prevailed from one end of the country to the other. Every exhibit was made at a great disadvantage. I bent all my energy to escaping the blight, and succeeded beautifully in that, only to see my vines go up, up, up, ten feet, blossoming in a scattering way after they were five feet high. There were two main causes; the first was that we had no freeze or frost to check a rapid start, and this was followed by excess of rain through the growing season. One of the worst vices of the Sweet Pea is an occasional tendency to rank vine and no bloom, and last year we had exactly the conditions to produce that. The high culture we give them nowadays necessitates a slow germination and a holding-back by frost, to steady them down to moderation in making vine. I have been preaching to our people some about the principle of making a plant work, in order to increase bloom. The root is the part of the plant that works, and the stiffer or firmer the soil the more wholesome exercise the root gets. A vine like the Sweet Pea should not have a soft bed underneath it. It induces a less hardy growth of the plant. It indulges the root and weakens it for its after work. It favors a top growth beyond the power of the root to support it. It stimulates growth at the expense of bloom. We have been following the trench system, which means that people have dug down and filled in with loose soil and fertilizer, and the very looseness of this bed under our seed and vines has been enough to make mischief. It should be trodden down. We have weakened the plants by this soft treatment, and

then have imprisoned them at the tenderest age down four inches below the sunny surface of the ground, and suffocated them still more by filling in the earth before they were at all hardened. Hence the blight. I have in preparing directions for other people kept in mind those who have a more or less light loam in their gardens. For all others who have a clay loam I feel but little sympathy, because they ought to have fine Sweet Peas with only half trying. But we had better all of us be shy of the trench method. I have a soft spongy soil well enriched. I had it turned up with a plough last fall, running the plough twice through each furrow. I shall simply hollow out about two inches where my rows come, treading the soil down if I find it soft. I shall in these shallow hollows just scratch out lines an inch deep for my seed, and cover only an inch, and roll the soil above and along the sides. If you have clay loam it will settle enough; only do not make any soft bed underneath your seed. I believe in thorough spading in the fall for the purpose of mixing, but I should let the frost be my plough for the spring. I believe this firming of the ground, avoiding the other things that have smothered our tender vines, will stop the blight. I am greatly annoyed with ground moles, and shall resort again to tar paper, setting pieces one by two feet in size into the ground every few feet to prevent their running lengthwise of the rows — and catch 'em if you can! Of course you all plant your Sweet Peas as early as possible. If the Sweet Pea gave us no other pleasure, it bids us hail with delight that first premature spring day, after the frost is out of the warmest part of our garden, for that is the foreordained time to plant this seed, unless you continue to set apart Fast Day for this purpose. You know by experience that you must plant seed liberally enough to allow for various losses. I adhere to the plan of planting in double rows, sowing at the rate of an ounce to ten feet. You ought to use more than that if it is cheap mixed seed. But after all losses the plants should not stand nearer than three inches apart.

Now for the cutworm. Some of the devils that did not go into the swine went into this grievous garden pest. If I open my mouth to boast that I don't have many of them I shall surely have my pride humbled soon. I say in good faith that in so beautiful a thing as a row of Sweet Peas it is a disgrace not to come out ahead of this foe. I believe first in going at him in the

fall just as soon as the frost has spoiled things. You can burn rubbish over the ground, put on a good dressing of salt, and freeze them out by spading up as late as possible. Mr. Eckford recommended gas lime, and some of you saw an account of the way Semple, the great Aster man, ploughs unslacked lime into his soil. The fall is a grand time for making a piece of ground very unpleasant for cutworms or their eggs. I find virtue in the bran and Paris green treatment. A pail of bran with a tablespoonful of the poison stirred in, and sweetened a little, and sown on the surface, or lightly hoed in in the spring, is a simple remedy. Diverting the cutworms by planting something of no value alongside for them to feed on helps to save some choice things, but you will enjoy your breakfast better if, Samson-like, you go out and slay a hundred of them as an appetizer. The only thing this good advice lacks is some professional charge, for we follow advice only when we pay for it.

The past two seasons have brought another pest: I call it a louse; perhaps you would call it red spider. It begins at the base of the vine and colonizes on the under side of the foliage. Its presence will be seen by the whitish, translucent spots on the leaves. It must be gone at vigorously either with tobacco tea or a strong force on the hose sprinkler. I used the latter, but with the excess of rain last year it did make the vines grow most wonderfully at an expense of bloom. Last year was surely an "off" year and does not count. The other rules for culture are simple and threadbare. Bush or trellis strongly, and so as to give them room to ramble. Water freely after the blooming period comes, but not too much before. Run the rows north and south to give them both the morning and afternoon sun. You are favorably situated here for easy success in this flower — almost anywhere near the sea coast they thrive.

Discussion.

President Appleton here retired and the chair was taken by Vice-President Benjamin P. Ware.

In reply to an inquiry the lecturer advised for cutworms to use six quarts of salt to one square rod. He said he would never trench again, at least not deeper than the ordinary furrow.

Ex-President James F. C. Hyde said he had suffered from the blight. His vines have grown as high as ten feet. He said he

should never again plant in a deep trench and should be extremely careful about earthing up; early earthing is disastrous. The cut-worm is a great pest, but he would not recommend the use of salt; he would plant lettuce to attract the worms from the Sweet Peas or other crop, and use the thumb and finger; this is the best remedy. Eternal vigilance is necessary; go over the rows at least once, and better twice, a day. This is his method, and he has taken many prizes in his day. Black shallow soil is best, and he believes in firming it, as good flowers cannot be grown on light soil without a great amount of attention. Be careful about the seed, and don't expect to get good results from Eckford's seed at first. He still believes in Sweet Peas, and thought Mr. Hutchins had taken the highest position in regard to them.

Joseph H. Woodford inquired what fertilizer to use and when to apply it.

Mr. Hutchins answered that it was always best to aim to get the soil as fertile as possible. Use stable manure and trench, as it is important to get the food into the ground and to deepen the soil; with eight inches of well-firmed soil above the manure or compost you are pretty safe. Never apply fertilizer in the spring, but hold it over until fall. Commercial fertilizers, such as phosphates, act rapidly; these are not needed at first. He would not apply wood ashes in the spring. Bone flour can be used safely at almost any time. A New Haven florist puts four inches of tobacco stems in the bottom of the trench, with good results; they contain a large amount of potash.

Giving a list of the best sorts is very difficult, as it means something different to the florist, the lady amateur, and the pocket-book.

In whites the best is Blanche Burpee, and this is what the amateur wants. The Bride is the same. Emily Henderson is better for cut flowers if you can get it to bloom freely. Mrs. Sankey is good, but has rather gone by.

In pink-whites use Blanche Ferry.

For rose pink, Prima Donna, Royal Robe, and Katherine Tracey.

The best shaded pinks are Apple Blossom and Royal Rose.

Of soft flesh pinks Gladstone has given place to Blushing Beauty.

For a peachy pink use Lovely; this might be called a shell pink, and possesses good qualities.

In buff pink we have Venus, which is very fine.

For bright rose Her Majesty is the best; others are Oddity and Splendor, but we do not need these.

Deep rose is found in Mikado, which seldom comes striped; drop Adonis, as it is not good.

In light scarlet use Prince Edward of York.

For scarlet, Firefly and Harvard; drop Invincible Carmine and Invincible Scarlet. For deeper scarlet we have Mars. For a cherry red, Salopian, which, however, is very expensive.

For orange salmon use Meteor and drop Orange Prince.

For orange rose, Lady Penzance.

For reddish primrose take Emily Lynch and drop Duke of York.

For rich purple, Duke of Clarence.

For black purple, Monarch.

For indigo, Indigo King.

For dark maroon, Stanley.

For blue, Captain of the Blues.

In lavenders we have lost one; they are the hardest to make hold the color; use Celestial or Burpee's New Countess.

For reddish mauve, Emily Eckford and Dorothy Tennant.

For magenta, Captivation.

For claret, Waverly.

For primrose, Mrs. Eckford; still good.

For primrose cream, Queen Victoria.

For scarlet striped, America.

For pink striped, Ramona.

For purple striped, Senator.

For blue striped, Princess of Wales and Gray Friar.

For orange striped, Aurora.

For deeper orange, Coronet.

For description of these varieties the booklet of the Sunset Seed Company will be found valuable.

Frank O. Carpenter inquired about Cupid.

Mr. Hutchins replied that it has a certain historic value; we need a hybrid race which shall be half dwarf, and this variety seems to be what we have wanted to work with by crossing; this is its only value, as it has short flower stems as well as dwarf habit. It does well on the Pacific coast, and will do better here than it has done. It originated in a field of Emily Henderson in the fall

of 1893, one plant only being found. The speaker had no trouble in getting it to bloom.

James Wheeler spoke of Red Riding Hood as looking deformed rather than pretty, as though it was going back a hundred years, and said it is a shame to put bad things on the market.

Thomas Harrison said that the lecture took him back fifty years, when some Egyptian Peas sent him gave a race similar to the present Sweet Peas. It was supposed to have been found in ruins in Egypt, when Sir John Gardner Wilkinson was exploring there, and was sent to an English firm to propagate and introduce as a Vetch.

Robert Farquhar thought it was Vicia, not a Lathyrus; no improvement to the Sweet Pea has come from Vicia. Cupid is undesirable; we want size, color, fragrance, and length of flower stalk; also strength to the stalk. Twelve years ago very few Sweet Pea seeds were sold in Boston; twenty-five years ago the leading firm had only one and one-half bushels; now we have quantities. Seeds from England are beautifully developed; much better than those from France and Germany. The speaker said that in two years his firm trebled their sales. To Mr. Hutchins, more than any one else, we are indebted for the magnificent development on this side of the water, and more than one-third the specialists on Sweet Peas are in this country. Mr. Hutchins' short list of good varieties is very good; it is just what the seedsman wants. We have to contend with a bright sun, which they do not have in England.

Benjamin P. Ware said that the best fertilizer for edible peas is ground bone or flour of bone. It supplies phosphoric acid and is adapted to produce flowers and fruit rather than vines. He would use it for Sweet Peas also, putting it on in the fall; though its effects might not be seen at once they would be lasting. Cutworms cause market gardeners a great deal of trouble; acres of onions have sometimes been cut down by them. Wherever you find a Sweet Pea or other plant cut down by them during the night, which is when they do most of their work, you will, if you dig for him in the morning, find the worm near by.

Mr. Harrison asked whether Sweet Peas are subject to the pea weevil.

Mr. Hutchins replied that of late years there had been few in

fresh seed — not so many as formerly. He had seen none this year or last.

Mr. Harrison remarked that we had no yellow Sweet Pea.

Mr. Hutchins said that though a Sweet Pea called yellow had been sold, the color was only a suggestion of yellow. Putting a good many together and bringing them into the house in the shade might bring out the color. Golden Gleam may be a deeper yellow, but he doubted whether a true yellow would ever be produced. Nature makes laws which limit our going beyond a certain point, but we are rapidly getting towards a blue.

California seed comes true in England and in the continent; the speaker had never known it to fail. Mr. Eckford's seed is grown under special circumstances. He always sows it in moderate heat for germinating only, to protect it from the rigidity of the climate. Then they can be put in the open ground. They can be transplanted easily.

In answer to an inquiry Mr. Hutchins said that the list given is suitable for amateurs. The kinds recommended are robust growers.

The thanks of the meeting were unanimously voted to Mr. Hutchins for his interesting paper.

MEETING FOR LECTURE AND DISCUSSION.

Saturday, February 20, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, Francis H. Appleton, in the chair.

In the absence of the author, the following paper was read by J. D. W. French, Chairman of the Committee on Lectures.

Some Phases of Market Gardening.

By T. Greiner, editor New York edition "Farm and Fireside," La Salle, N.Y.

It seems to me too bold an undertaking for an outsider to come before your celebrated body of practical horticulturists — the leaders in their chosen field — with the idea of enlightening you on any phase of the garden business. We are in the habit of looking to you and to the printed reports of your proceedings for instruction, and for new ideas and suggestions.

It is not improbable, however, that an account of the development of market gardening, and of the problems with which your brethren in these more western districts are brought face to face, may be of some interest to you. I had hoped to tell you of this personally, and perhaps receive in return some words of wise counsel and consolation — some suggestions how best to meet the difficulties which beset us here, and how to lift the business out of the mire and ruts into which it seems to have fallen during these "hard times." Circumstances and previous engagements, unfortunately, compel me to entrust my own side of the story to paper.

Not Flourishing. — At the outset let me say that the business here has not been flourishing for some years. Every gardener is complaining. We used to have a good market in our near cities, and coin money freely. Now the free coinage of silver in the market garden has become a myth. The great problem before us is how to manage so as to be able to continue in the business, how to earn enough to cover the wages of labor, and to make a bare living from the garden.

Causes. — The causes of this unfavorable change are not far to seek. It has been brought about by the general depression in the values of other soil products, and aided and abetted by the constant advice (not altogether judicious) of agricultural writers and the agricultural press. I know I am not free from blame myself. But look up some issues of leading eastern farm papers (the "Rural New Yorker," for instance) of half a dozen or a dozen years ago. See the glowing descriptions of the results of intensive culture, of the profits to be found in vegetables and fruits; of the freely reiterated statement that the eastern States were destined to produce horticultural rather than agricultural products. See the sensational teachings found in earlier bulletins of the New York Experiment Station, and in speeches of the late director (Dr. Collier) about the great profits from forced crops. Note especially the glittering and tempting assertion coming from so high an authority, that a quarter acre under glass would give greater returns than a hundred acres of farm land, the amount of $11,000 (if I remember correctly) being figured out as the proceeds from one acre under glass.

Ruinous Competition. — Then came the great slump in prices of cereals, potatoes, etc. A large number of farmers who pre-

viously had contented themselves with growing wheat, oats, corn, potatoes, and stock, finding loss rather than profit in their accustomed crops, and being tempted by the often extravagant promises held out to them of better returns in garden and fruit crops, forsook their legitimate products, and began to grow berries, onions, and a general line of garden vegetables. As a result, the markets became flooded with these products, and prices in many instances were forced down below the cost of production. So we older gardeners met loss instead of profit, and the new-comers in this field have found nothing but sore disappointment.

Possibly you, near the seashore, and with the wealth of the country concentrated around you, have been less affected by these changes than we were here. But I find from the market reports that the big eastern cities also were glutted with garden products, and prices have ruled lower than ever. Growers of forced vegetables of all kinds, too, have suffered from ruinous competition. Of mushrooms — once a great source of profit — there were at times more than could be sold. Hothouse tomatoes and lettuce were plenty and cheap, and there seemed to be in the markets a plethora of all vegetables and at all times.

Too much Instruction. — I believe that we have instructed too much. What used to be trade secrets are now the common property of the masses. Tuition has been practically free, and the masses have learned to grow articles the production of which used to be the business and privilege of the few. We have written too many articles, books, and pamphlets. Stations have aided with their bulletins, and societies with their free lectures and discussions. The urgent appeals for the production of garden and fruit crops have been too persistent and over-emphatic.

No Welcome for New-comers. — While the general effect in bringing the blessings of a fruit and vegetable diet within the reach of everybody who in any respect deserves to be called a consumer may be wholesome, thus justifying somewhat the course of those who have helped towards this result, we shall have to modify, if not reverse, our teaching of a quarter of a century or more, and now try to discourage the tendency of the many unskilled outsiders to rush into market gardening as a supposedly profitable business. There are too many producers of trash in it already. Market gardening has now entered a stage of development in which a thorough weeding-out seems imper-

ative and inevitable. The less skilled portion of its devotees will have to drop out, and only the fittest can survive. It is time for us to warn those who, having made a failure of general farming, clerking, store-keeping, or office-holding, intend to take up gardening without previous training and experience. If our efforts to scare them off are successful, it will be a favor to themselves as well as to those already in the business. It will prevent undesirable competition for the latter, and save the former certain disappointment and loss of time and money.

Trash not Profitable. — That the production of trash does not pay has been reiterated almost *ad nauseam ;* and yet the markets are filled with trashy stuff that weakens and depresses the prices of even the better grades of goods. Really superior vegetables may suffer in this competition, but they seldom fail to find a fair demand and comparatively fair prices. In a few lines we secure even our old-fashioned good figures. Possibly the depressed condition of the market garden business may prove a blessing in disguise, by discouraging raw recruits from coming into our ranks, and by thus preventing a further increase of trashy production. Possibly with the return of old-time general prosperity (another period of which seems now about due us) the consumption of garden products can be increased to such an extent as to give us again paying prices for the general line of garden stuff and good profits to the skilled grower.

To restrict Production. — Meanwhile it is in order to talk of restricting the production rather than extending it, especially in those lines which seem decidedly overdone, as, for instance, in that of onions and tomatoes for the late summer and fall trade. This is largely a local question. What special crops one can produce with best prospects of profitable sales is a matter which each individual gardener must settle for himself. It would not be safe to point out special crops as promising better pay than others, for that would only lead to a general rush and a breaking-down of the prices of the products thus recommended for more general culture.

Cheapened Production. — The talk of reducing the cost of production may have a "chestnutty" flavor; yet I believe the story has not been half told. It is true that the skilled gardener appreciates and utilizes every new implement put forth as saving hand labor in the garden, from the newer style seed drill to the

Breed weeder and the Bemis transplanting machine. It is true that he tries to get his soil in shape to bring the largest yields, and that he crowds his crops, following one with another in rapid succession, so as to make the most of his opportunities. There is one point, however, in which almost all of us have blundered, and made ourselves guilty of sinful extravagance. This is in the matter of purchasing manures.

Buying Plant Foods. — Every gardener is a buyer of plant foods in some of their forms. In most cases we have paid excessive prices for them. When the finished product sells for so much less than formerly, the raw materials should be had at correspondingly smaller cost. Yet the general lowering of prices seems to have made an exception in the case of plant food materials. We still pay old time rates, and in many instances even increased ones, for stable manure. This form of plant food is a waste product of stock yards and livery stables. If gardeners in the vicinity of the cities could agree to be less anxious to buy it at whatever the seller may see fit to ask, the latter would have to sell it for what you — the buyer — might see fit to offer.

I myself am more fortunate in this respect than most of my brethren in the gardening and fruit-growing business. By sharp bargaining I obtain first-class mixed stockyard manure, from grain-fed hogs, sheep, horses, and cows, at $17 per large car well loaded (capacity of car 60,000 lbs.), delivered here at the station, a quarter of a mile from my gardens. A ton of such manure thus costs me less than 75 cents; and, at the same rates that we pay for plant food when buying of fertilizer men, is worth easily double that amount. But not everybody has such a chance. In some cases we may be able to draw on home resources, by making composts of dried muck with ashes and bone, or with other forms of mineral plant foods, and using such composts in place of the stable manure when that cannot be had except at an exorbitant price. I offer this only as a suggestion.

Concentrated Plant Foods. — The great majority of gardeners also use concentrated plant foods, and sometimes with telling effect. Yet in their purchase we have been careless and extravagant. I do not like to antagonize that powerful body of men, the so-called fertilizer manufacturers. We need their coöperation. They have had a mission. Like the nurserymen they had to send their agents among the tillers of the soil to induce them to

make use of a good thing. This agent system of selling, however, is expensive. Then there are bad debts, and debts of long standing, and interest on the investment and outstanding claims, and a heavy expense in advertising, and other outlays and losses, so that, taken altogether, the fertilizer men may have to charge us the going rates for these plant foods in order to make their old-time profits. But why should they not be satisfied with smaller profits when we and all the rest of the tillers of the soil are obliged to do this?

Pertinent Queries. — I will add a few more pertinent questions: Why shall we, who know what we are doing, and who try to do a fair and square business on an economical basis, help to carry the losses of poor sales when there is absolutely no necessity for it? Do we really need ready mixtures? Do manufacturers pretend to know more about the needs of our special crops in each special case, or on our special soil, than we do? Is one and the same mixture just what is needed for any one crop under all circumstances? Is it not absurd to talk about special onion manures, special potato manures, special cabbage manures, etc., when the conditions of the soil on which each individual crop is planted vary so much? Who will tell us whether a certain crop needs exactly six or eight or ten per cent of potash? Why will manufacturers sell their slightly differing mixtures of three simple food elements, in slightly differing forms, under twelve hundred different trade names?

Home Mixtures. — I can see no necessity for using ready-made mixtures in the garden, but the strongest reasons for avoiding that course. Let us examine the fertilizer analyses as given, for instance, in one of the latest bulletins issued by the New Jersey Experiment Station (New Brunswick). The mixtures sent out by our various firms as especially adapted for garden crops vary in real value between $20 and $26 per ton, and sell at from $30 to $40. In other words, the purchaser is asked to pay the full value of the article and an additional fifty per cent of its value to make good expenses and losses of the seller, and to swell his profits. Now if we buy the following ingredients:

500 lbs.	nitrate of soda, costing about	$11 25
1,200 "	dissolved South Carolina rock, costing about .	6 00
300 "	muriate of potash	6 75
2,000 lbs.	. . . . .	$24 00

we have a ton which contains about four per cent of available nitrogen, nine per cent of available phosphoric acid, and seven and a half per cent of potash (K_2O); cost us $24, is worth $27.90, and the equal of a fertilizer sold by manufacturers at about $40 per ton. Professor E. B. Voorhees, director of the New Jersey Station, suggests the following formula for garden crops, viz. :

Nitrate of soda	200 lbs.
Dried blood	200 "
Tankage	200 "
Acid phosphate	1,000 "
Muriate of potash	400 "
Total	2,000 lbs.

This mixture will analyze about three and a half per cent of nitrogen, eight per cent of phosphoric acid, and ten per cent of potash. In cost and value it is not materially different from the other.

Applying Plant Foods. — Some gardeners may fear the labor of mixing. But why mix these ingredients at all? Nitrate of soda and muriate of potash are as easily sown over the ground, broadcast, as wheat. Acid phosphate can be slightly moistened by sprinkling and working over on a tight barn floor, or in a wagon box, and then applied by hand. When we have a chance to effect a saving in cost of from $12 to $16 per ton, we can well afford to expend a little extra labor in application. My practice is to sow each ingredient alone, taking pains to distribute the proper amount.

Direct Dealings. — A prolific source of loss to us has been our carelessness in selling to irresponsible buyers, and in consigning products to commission merchants. For us here, the only safe way seems to be to deal directly with consumers, and in rarer cases with retailing grocers, for cash only. If we have superior vegetables, we can usually find private buyers willing to give a fair price. Our grocery stores are not satisfied with reasonable profits. Just at this time they are unwilling to pay to the grower more than from 25 cents to 30 cents a dozen for the very choicest of hothouse lettuce, while they are unwilling to sell the same at less than 10 cents a head. The only thing we can do is to hunt up consumers ourselves. Our way to treat commission

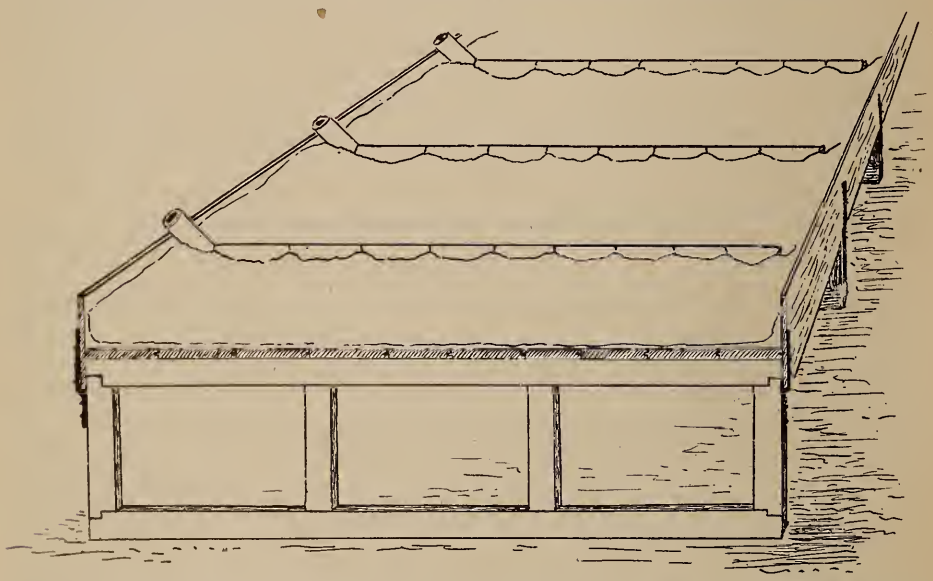
merchants is to give them no chance. If we ship anything to them we soon follow the goods, and keep watch of the dealer's doings until the money is in our pockets.

Nitrate of Soda. — No single plant food has ever given me the striking results which I frequently obtained by the use of nitrate of soda, especially when applied to beets, spinach, cabbages, and cauliflowers, either alone, as in the case of the former two, or in combination with muriate of potash, as in the case of the latter two. Sometimes the effectiveness of the nitrate has been further increased by the simultaneous use of lime, and maximum results have thus been secured at a minimum cash outlay. We have usually applied nitrate of soda at the rate of from 200 to 300 pounds per acre, and muriate of potash in slightly smaller quantity, both broadcast. These fertilizers are always worthy of trial in growing the garden products named, and perhaps in growing others.

Some Remunerative Crops. — The following brief remarks may suffice in regard to what we consider our money crops: Early peas come first, and we find them profitable if we grow only what we can dispose of directly to consumers. Strawberries, when properly managed, have never yet failed to give us fair returns, even when disposed of at wholesale to groceries and commission houses. We have quick sale, at good prices, for first early tomatoes, and the only trouble is that even with all the pains we take we can get only a small portion of the crop on our earliest plants to ripen before the great rush knocks the props from under the tomato trade. The Early Ruby type of tomatoes (including the newer Leader), which bloom and set fruit freely even on the young plants under glass, give us some very early fruit, and we are in hopes of finding before long a variety having these characteristics, with uniformly smooth fruit of fair size. The Prizetaker onion, grown on the plan of the so-called "new onion culture," has been one of our most profitable crops, and the Barletta pickling onion ranks very high with us as a money-maker. There is a good demand, seldom fully met, for these very small, white bulbs, and even when sold through the regular commission channels they have netted us over $3 per bushel. The crop is produced with little trouble inside of three months, brings cash returns early in September, and leaves the ground in good shape for a succeeding late crop, like celery, spinach, etc.

Among other crops that we can rely on for some profit are late cabbages, which bring from $12 upwards per ton; melons, especially of high-flavored varieties like Emerald Gem; and Hubbard squashes.

Newer Devices and Methods. — Few of the newer implements have been such a help to us as the Meeker smoothing harrow, although it has imperfections and the great drawback of high price. We now hope to find in the Clark's cutaway smoothing harrow an implement costing less than half as much as the Meeker, and doing fully as good — in some respects perhaps better — work. The Breed weeder and Bemis transplanter have already been men-



Bench, double width, arranged for sub-irrigation. Tiles laid in cement. This bench has been in use with me for two seasons.

tioned, and they are found to be great labor-savers. Among newer methods there are two which have left a deep impression on our garden practices: The one is the so-called "new onion culture," which has enabled us to make the Prizetaker and New Gibraltar onions very profitable within the limits of people's appreciation of mild flavor, and of their willingness to buy onions of very large size. The other is the new system of applying water to greenhouse crops, namely, by sub-irrigation. This seems by far the safest plan for lettuce beds, and it has enabled me to grow finer, larger, and healthier plants, especially of the hard-heading newer forcing sorts like White Perfection, New Hothouse, etc., than the old way of surface watering ever gave us. The accompanying

sketch shows the bench as I use it. The bench is made of a two-inch plank bottom with sides of four-inch board, resting on a frame of three by four scantling, and made water-tight by means of a cement lining. Lines of two-inch tile are laid upon the bottom across the bench, two or two and one-half feet apart, the end tile, which receives the water, turned up at an angle of forty-five degrees.

I shall have to pass over for this time other subjects which might be worthy of fuller notice, such as the need of more thorough cultivation of the home market and the hopes with which some of our brethren in these border towns look upon coming tariff changes as means to free them from the formidable competition of Canadian gardeners, and thus to bring about at least a temporary rise of prices in garden products.

In conclusion, let me express the hope and wish that the return of old-time prosperity may be close at hand, and that we may thus be relieved of all further anxious speculations and doubts as to the future of market gardening. We have full faith that all will turn out well in the end.

Discussion.

Benjamin P. Ware said that he had been pleased with the character of this paper, and happily disappointed. It had not told us of the theory and practice of market gardening and he was glad of it; it had given us what we need. As the prices for produce diminish we must adopt some method to reduce the cost of production, and the importance of reducing the cost of production has been brought out. In business today we find the waste products are used to manufacture new articles, but we farmers and gardeners are the most extravagant of all. He wanted to emphasize that we can save one-third or one-half the cost of fertilizers by mixing them ourselves. We must buy the raw materials and mix them ourselves, and use what our crops require. The mixed products on the market are not what we want. He did not know why such mixtures are made. We must learn from the experiment stations what we need, and mix as our plants require. Mixed fertilizers do not supply that. Professor Jordan, at a farmer's institute in New Hampshire, which the speaker attended, emphasized the idea that we should contract with agents for the materials, and that a saving of fifty per cent can be made by

so doing. Advantage must be taken of these things; we have put before us in bulletins what we need for our plants and animals as well. Mr. Ware asked his fellow-farmers and market gardeners whether they were willing to pay this extra profit to the manufacturers. If they were they might do it; he would not. Mixtures are all humbug; names are used to catch your eye; if one does not, another will. He approved of the method presented; we must see where we can save anything and save it if we wish to succeed. Mr. Ware concluded by calling on one of our fellow-workers, Mr. Sullivan, of Revere, whom he saw in the audience.

Mr. Sullivan, after thanking Mr. Ware for the call, said: Labor is the first great expense, but if we try to reduce the wages of our laborers, and thus reduce the cost of the produce, we commence by making our own townspeople poorer; they must live, and their children must go to school. As it is now, they have a hard time. Italian laborers are now getting plenty, and work for very small wages, but is it desirable labor to hire? We have given them a fair test, and find that to a certain extent they can be employed, as for weeding and the like, but if you do not have an interpreter you cannot explain to them what you want done, and a foreman is required to stand over them continually. They are willing and good workers, but as they cannot understand the English language we have come to the conclusion that we cannot afford to reduce the wages of present laborers. Another point is the cost of manure; this has been well explained in the paper. We are paying too much already. In the city of Chicago, and some other large cities, manure is given to the gardeners by the stable-keepers; the gardeners thus get it for the hauling, which often amounts to $3 or $4 per cord. This is a help. Mr. Sullivan said, in regard to fertilizers, that he had used them in all forms, and understood all about the manufacture of them and the ingredients used. Taking the material in gross, there would, without doubt, be a saving of fifty per cent, but mixing this material is not general, and many have not the intelligence that Mr. Ware has to put into the mixing. If the fertilizer dealers would be satisfied with small profits, say $25 per ton for their fertilizers, the farmers would be satisfied. Some fertilizers must be used, but we are at present dissatisfied with what are now on the market. The manufacturers will come down, and the sooner the better. We are protected by the experiment stations, so that

the fertilizers put on the market are true to the percentages marked on the bag, but the price is so high now that we are driven to lessen the consumption.

Hon. Aaron Low expressed his appreciation of the lecture. The great problem in market gardening, he said, is the production of crops at low cost. If we cannot get the price necessary to pay expenses, we must have lower-priced labor. We want to get our money's worth in everything, and he did not see why a farmer could not mix his own fertilizers. All understand what is needed by the plants — nitrogen, potash, and phosphoric acid. Apply nitrate of soda first, then muriate of potash, and finally some form of phosphoric acid; apply separately and harrow. The progress now being made does not lessen the labor much. Products are continually bringing lower prices, while the labor required remains the same. Agricultural industry is depressed all over the country; this is caused by over-production, and also, to a great extent, by the reduction in prices. Our foreign population hawk around produce of inferior quality on our streets; this has a bad effect, reducing the prices of good articles. If the farmer cannot use manufactured fertilizers and make them pay, he must use something else. The speaker uses fertilizers a good deal, being so situated that he cannot get anything else. Each must answer the questions as to what fertilizer he shall use, and whether he shall get them separately and apply them separately, or mix first, or whether he shall get them all mixed.

Another gentleman said all soils are different; he tries to restore the original elements to the soil. He always asks himself how he can best restore the fertility of his soil and bring it back to the original condition.

Joshua C. Stone said he did not believe fertilizers all humbug. He lives near the abattoir and knows that all done there is done openly. It costs them thirty-six dollars a ton to make their fertilizer and they will sell it for thirty-eight. Others might buy what they think best for themselves; he would not give up manufactured fertilizers. You can put manure on one-half of an acre of land and fertilizer on the other, and if the fertilizer does not give better crops the manufacturer will return your money. He called that honest. They also admit that there is no fertilizer equal to barnyard manure. He did not like to see them handled in this way when they were not present.

Kenneth Finlayson told of his experiment with mixing fertilizers. He said farmers have the brains, but not the experience, to mix fertilizers. He uses extensively under glass a fertilizer consisting of Canadian unleached wood ashes, guano, and soot; this gives fine results. In the absence of soot he once used the other two, which acted on one another in such manner as to liberate the ammonia, and as it was a cold night the conditions were such that the ammonia destroyed the leaves of all the roses to which the fertilizer was applied. His point was that the manufacturers of fertilizers would not make such errors.

Mr. Low said that ashes should not be mixed with any manure, as it liberates the ammonia.

Mr. Ware did not like the statement made by one speaker, that market gardeners have no brains. There is no business in which the chance to use the sciences is so marked as in market gardening. He did not see any difficulty in mixing fertilizers; all we need is a barn floor and a shovel. Empty the bags of separate materials, giving the proper percentage of each, and then mix. The expense of mixing is about fifty cents a ton. The ammonia is the most expensive part of fertilizers. Don't accuse us of ignorance, Brother Stone.

Mr. Stone answered that if we saw Mr. Ware's crops we should understand his meaning.

Mr. B. B. Butler said that he understands that it is the nitrogen which starts the leaf growth on plants. Why, then, do we need to mix at all?

Mr. Ware replied that the mixing was merely a saving of the labor of putting it on. You can put on three handfuls at a time just as easily as one.

Mr. Butler asked how much does going over three times amount to?

Mr. Ware said we put nitrate of soda on for the leaf growth, and the rest to get the crop, so that we should apply the nitrate of soda when the crop needs it. Phosphoric acid and potash are not needed then. Apply the nitrate in small quantities.

Dr. Crozier said there is one loss in artificial fertilizers which has not been mentioned. If we buy a ton of superphosphate of lime, what do we get? At least fifty per cent of sulphuric acid and water. The acid has united with the larger part of the lime as an insoluble sulphate, and the phosphoric acid is in the form

of a soluble biphosphate of lime, which must be neutralized by the alkalies in the soil in order to be used by the plants. When South Carolina rock is used in making the superphosphate, much of it reverts and becomes permanently insoluble. Phosphoric acid is almost the only constituent of modern fertilizers which admits of a reduction in cost, as nitrate of soda and the various forms of potash are probably as cheap now as they will ever be. Minutely divided bone dust will be found to be the most satisfactory form in which to use phosphoric acid, as a large proportion is available for present use, and the residue is rapidly brought into condition for future crops.

A mixture of half a ton of cotton-seed meal (a cheap and continuous source of nitrogen), six hundred pounds of nitrate of soda, half a ton of high-grade sulphate of potash, and one ton of pure bone flour will meet the requirements in most cases.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 27, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President BENJAMIN P. WARE in the chair.

The following paper was read by the author:

GOOD FOOD FROM THE GARDEN.

By Miss ANNA BARROWS, Managing Editor "American Kitchen Magazine," Boston.

Since the Massachusetts Horticultural Society has asked a woman to address this meeting, presumably it wishes to look at the interests which it represents through the eyes of the housekeeper. This is a hopeful sign, and indicates that in the near future producer and consumer may coöperate to secure the best interests of both parties. Today they seem to be separated by a multitude of middlemen, who, perhaps from ignorance of the best methods of handling garden produce, often injure rather than help this branch of trade.

The gardener, the marketman, and the housekeeper should have frequent conferences, to the end that all people should be better fed; that the human body may repel disease and temptation to crime, and may be able to bear the heavy burdens of the twentieth century. Let us look at the possibilities of obtaining good food

from the garden in the past and at the present time, and then consider what may be done to improve the supply of such products and increase their use in the future.

The successive stages by which our present methods of feeding ourselves have been evolved from the customs of primitive man form an interesting study, which is of especial value to those whose business it is to provide food for mankind. The earliest foods of races in warm climates were fruits and nuts, of which nature furnished an abundance, and which were eatable with little or no preparation. In some cases the women and children ate the natural fruit, while the warriors fed on dried fruit prepared with oil. Others subsisted mainly on raw flesh, and, perhaps by accident, discovered that new and agreeable flavors were developed by heat. Broiling or roasting over the open fire has been with all races one of the first steps in the art of cookery, and meats rather than vegetables were the objects of early experiments in this direction.

> "To cookery we owe well-ordered states
> Assembling men in dear society."

Savages found it a simpler matter to pursue their food rather than to take the chances of producing it from a fixed place. The placing of a hearthstone and the planting of seeds were higher steps on the ladder of civilization. For a nomadic life a larger area of country was required than is sufficient to support a given population by other means. Even grazing, which succeeded the chase as a method of supplying food, will not support a large population on a given average.

This is one of the strongest arguments that vegetarians can bring in support of their cause. As the world grows more populous fruits and vegetables must supply the larger portion of the food of its inhabitants. Not until men became versed in the art of agriculture was it possible to make further advance in cookery, since the products of the vegetable kingdom required greater development before they offered much inducement for the experiments of the cook. Nor do the most skilful efforts of the farmer avail unless the cook handles his products with equal intelligence.

Count Rumford once said, "The number of inhabitants that can be supported in a country depends as much upon the art of cookery as upon that of agriculture: both arts belong to civilization; savages understand neither of them."

Progress in both these arts is shown by the very general interest in cookery displayed by various agricultural organizations. They are recognizing that the quality of food product is not assured when it leaves the hands of the farmer, and that quite as much depends upon its preparation for the table as upon its cultivation.

Among the topics discussed recently by the grangers have been such as "The Garden of the Farmer *versus* the Pork Barrel." Another worth considering would be "The Home Garden *versus* Patent Medicine."

A census of New England today would fail to show a very general knowledge of the almost infinite variety of vegetables which might be cultivated within its borders.

It has been said that vegetables, to the early settlers of New England, meant only potatoes and beans and corn, with a boiled dinner now and then. That was a slight advance upon the habits of the Indians, but to their instruction we are indebted for much of our knowledge of corn and beans.

This ignorance of valuable foods is the result of habit and the inertia which makes it hard to enter new paths. The reason often given is that people generally do not like vegetables; perhaps it would be nearer the truth to say that we do not know how to cook them so that they will be palatable.

Not only have we failed to learn how to use new vegetables, but have nearly lost the art of making some of the standard dishes of the past. The increased facilities for obtaining meat from the West, and the cheapness of canned foods packed in California and the South, have rendered it unnecessary for us to exercise our ingenuity to prepare a variety of palatable dishes from the scanty store of products available to our ancestors. From the corn they prepared hasty pudding, hulled corn, brown bread, boiled and baked puddings, and succotash with the bean, which also furnished the bean porridge and filled the bean-pot, to be baked till tender and savory. Sauerkraut found a foothold in some sections of New England with early German settlers and remains until this day, and pickles of all sorts and kinds have always flourished. As a whole New Englanders have not taken kindly to soups and salads, and have yet to learn the possibilities of vegetables in these directions.

The early New England housekeepers achieved wonders with

flour, the most refined food product at their command, but they did not try many experiments with vegetables; possibly because the men were too busy in subduing the new land to provide very satisfying gardens. Then as now the cook books gave comparatively little space to directions for the preparation of vegetable foods.

The criticism usually made upon the present food of the American people by those familiar with dietary standards and the customs of other countries is that we eat far too much meat. By a comparison of the foods of different nations and classes of society we should see that meat eating is not essential to strength, and that the very poor depend upon vegetable food because it is cheap. On the other hand many of the wealthy find in the expensive varieties of fruit and vegetables, like the mushroom, the globe artichoke, and the products of the hothouse, an opportunity to spend money lavishly and to gratify their æsthetic tastes.

For the majority of our people today vegetarianism is hardly practicable, but its adherents increase rather than decrease. While in many instances vegetable substances furnish more nutriment in proportion to the cost, they are less quickly digested and less completely assimilated than animal tissues. Now we are obliged to employ the animals as middlemen to transform the tough grasses into substances which can be digested by us. As our scientific knowledge increases, doubtless we shall find ways to prepare as food many substances now worthless.

Though the people of this age continue to be meat eaters, the quantity now consumed because of the abundance of meat in this country is far too large. The average diet would be improved by a greater use of vegetables. Animal food should not constitute more than one-fourth of the whole amount eaten.

There are objections to an exclusively vegetable diet, and no radical change should be made; but equal objections may be brought against the use of meat. Probably a larger bulk of vegetable food would be required to produce similar results, and the vital processes would move more slowly. On the other hand, some of our most troublesome diseases, like intemperance, cancer, and gout, are thought to have a direct connection with excessive meat eating.

B. W. Richardson has said: "Keep as near as ever you can to the first sources of supply, fruits and vegetables."

Allowing for occasional idiosyncrasies, people can eat anything, and habits in this direction are easily formed. We learn to like olives and mushrooms because the taste for them is a proper one; in the same way we may enjoy a variety of vegetables.

At the present day we are beginning to realize that a knowledge of the composition of each food is essential to its wise selection and preparation. Vegetables and fruits afford all the five necessary food principles, but the proportions are hardly satisfactory for a perfect diet. Fats and proteids need reënforcement, and this is accomplished by the use of butter, oil, eggs, and meats.

To generalize in describing the foods which come from our gardens, they contain water, starch, sugar, gum, pectin, fats, proteids, and mineral matters. The great amount of water — from seventy-five to ninety-five per cent — serves to supply in pleasant form our most essential food. The lack of water in the average diet has been called our "gravest dietetic error."

The carbohydrates — starch, sugar, and the like — are the most important solids in vegetables. The potato contains more starch than any other moist vegetable, and according to late government experiments this is more easily digested than many other starches. Sugar is too often lost by throwing away the water in which vegetables are cooked. Dextrin and dextrose are formed from starch in the maturing of fruits, and probably in some processes of cooking vegetables. Pectin, pectose, and gum are substances as yet little understood. Fats in our ordinary garden vegetables are in too minute quantities to be reckoned. The proteids are complex substances and are most prominent in the pulse family. They are less digestible than animal proteids; even a third may pass through the system undigested.

The mineral matters are valuable forms of phosphates, iron, and potash, in keeping the blood pure.

It is interesting to note the different parts of plants which are used for food — the roots, stems, leaves, and seeds. The latter are used mainly in the dry form, and absorb much water in preparation. This must be remembered when studying analyses of dried legumes and cereals.

The cellular structure of vegetables, which constitutes nearly half their bulk, is the chief barrier to their use and the great obstacle to be overcome by cookery. This material is closely

allied to starch and is variously subdivided as cellulose, woody fibre, and lignin. These cell-walls cannot be wholly separated from the nutritive substances which they contain. In moderate quantities cellulose may aid the process of digestion by giving the necessary bulk for the stomach to work upon, and thus afford a wholesome stimulus to intestinal contraction. The denser forms of woody fibre cannot be digested, and moreover hinder the process in other substances associated with it.

Plants growing rapidly with plenty of water and sunshine usually have less of this woody fibre, and it is the aim of the gardener to eliminate it as far as possible. The cook tries by higher temperature to soften this substance, and if boiling water could be raised to a point above 212° Fahr. it would be desirable.

By improved methods of cultivation the agriculturist has removed the acid flavors of the natural vegetables and has reduced the proportion of woody fibre, but he undoes much of his work by careless methods of delivery to the consumer.

Between the farmer and the marketman certain trade customs have grown up which are calculated to foster ignorance on the part of the consumer and against which the protests of intelligent housewives avail little. A large part of the vegetables displayed in our markets are overgrown, wilted, or carelessly prepared. Those which suffer most from this treatment are radishes, cucumbers, green peas, beans, corn, and summer squashes.

The public must be educated to appreciate quality rather than size; to recognize the facts that wilted southern vegetables never equal "natives" in flavor, and that gain in size usually means a corresponding loss of flavor.

Why should we have to lose the sweet nutty root of the celery because it is pierced with a nail? Why need asparagus waste its strength in producing several inches of stalk which must be thrown away? Why should not summer squashes and cucumbers be sold by weight as well as winter squashes?

The arithmetic of the market gardener is mysterious to the housekeeper — sometimes onions are sold by the pound; sometimes by the quart. Bunches may be three or four or eight or any number that suits the dealer's fancy. Marketmen say that women are becoming more interested in all these things, and a simplification of methods of sale would increase this interest.

The public is not wholly to blame for its ignorance in these

directions. The gardeners often grow different varieties for their own table from those they offer for sale, and the greengrocers apparently know no difference in qualities of different species of vegetable. One market handbook devotes fifty pages to describing meats and fish, while but ten pages are given to vegetables and fruits.

Easy transportation and culture under glass have served to take away our appetite, since when we can have anything at any time we do not care for it at all.

The forcing of vegetables out of season has confused the housekeeper unfamiliar with farm life. She does not know when anything is at its best and does not take advantage of an abundant market, but supplies herself with canned vegetables, which are always in season.

There should be a strong movement against the use of foreign substances in canned and dried vegetables and fruits. Salicylic acid, coloring matters, and sulphur may or may not have ill effects, but they surely cannot improve the quality or flavor of first-rate vegetables.

Dried fruit and vegetables would be more popular if specific directions had been given for their use. Few persons realize that long soaking and little cooking produce the best results. Perhaps all this instruction will have to be given by some enterprising seedsman, just as the food-product people show how to cook their wares.

The housekeeper knows little of the comparative merits of the vegetables in the market, and often is no wiser than the New Jersey family recently reported by the United States Department of Agriculture, where 14.8 per cent of the whole sum spent for food went for oranges and celery, which furnished but 1.4 per cent of the total full value.

To quote Count Rumford again: "I constantly found that the richness or quality of a soup depended more upon the proper choice of the ingredients and a proper management of the fire in the combination of these ingredients than upon the quantity of solid nutritious matter employed; much more upon the art and skill of the cook than upon the sums laid out in the market."

The methods of cookery applied to vegetables are similar to those used for meat, but must be adapted to the composition and condition of the individual specimen.

There is usually some one way best for each vegetable, but where one kind only is available it is necessary to serve it in a variety of ways. This perhaps explains why the average cook book gives more receipts for the potato than for all other vegetables. Almost any vegetable may appear by due combination with milk, butter, and eggs in soups, fritters, croquettes, souffles, or salads. Suitable utensils are essential; vegetables should not be cooked in iron kettles when any others are attainable; strainers, ricers, and presses are desirable.

Strong flavors frequently are due to careless preparation. Careful trimming and thorough washing are essential. Wilted vegetables are improved by soaking. Salad plants need especial care in washing to remove parasites as well as hellebore or Paris green.

By cutting in small portions the time of cooking may be hastened. In general, vegetables are to be put in soft water, freshly boiling, and kept at the boiling point until tender. If uncovered the color is better preserved and the odors are less pronounced. Salt should be added when the cooking is partly completed. Soda may be used legitimately in minute quantities to aid in softening the water.

As a rule, with all sweet, well-flavored vegetables the water should be allowed to evaporate at the end, instead of draining it off. By that means all the valuable qualities are preserved.

In one of the publications of the United States Department of Agriculture the difference in digestion of the same food cooked in various ways is thus stated: Whole peas soaked and cooked, 60 per cent digested; peas cooked a long time and strained, 82.5 per cent; pea flour cooked with milk, butter, and eggs, 92 per cent. This would seem to prove that the portion of vegetable food considered undigestible can be reduced by right methods of cooking. Why should not a meal or flour of peas and beans be obtainable in our general markets?

It is impossible to give the exact time for cooking any variety of vegetables, for every sample will differ. They are unpalatable when underdone and also at the other extreme.

Contrary to the usual impression vegetables may be warmed over if care is taken in the process.

But it is to the home garden that we must look for the real luxuries in the vegetable line — where they can be tended and

petted individually and gathered as required, each at its own perfection.

The best land is none too good for a garden. It should be near the house, where each member of the family can spend the odd minutes giving cultivation to the plants, and in turn receiving fresh air. More outdoor work for women would add immensely to the comfort of the family. The garden should be planted to fit the family as carefully as a library should be selected. Many a professional man, living in city suburbs, would save doctors' bills as well as grocers' bills by cultivation of a garden.

Can we wonder that it is impossible to work the city poor out into the country when all education is away from Mother Earth? Had Mayor Pingree started the potato gardens a generation ago matters might stand differently today. Some foreign countries have found it wise to teach horticulture in their public schools. It is not strange that country boys and girls come to the city, since they are not shown the interesting phases of country life. Why do not the horticultural societies offer generous premiums for the best lot of vegetables raised by boys and girls?

What has the future for us in the supply of garden products? More progress than has been made in the past. By irrigation, electricity, and new devices, methods of agriculture will reach greater perfection. New districts in New England even may become as famous for some specialties as Kalamazoo for its celery, Boston for lettuce, and Essex County for onions.

New England is becoming a resort for summer travellers, and change of food is as necessary as change of air. Let the boarding houses refrain from imitating the city hotels, and make a specialty of fresh fruits and vegetables raised in the immediate vicinity, and the better class of company will appreciate their efforts.

Professor Goodale said awhile ago that as yet hardly one per cent of the plants known to exist are used as food. When we think of the unpromising condition of the natural potato and celery, here is an attractive field for experiment. Moreover, we have not quite succeeded in supplying all the needs of our own people when we import Scotch potatoes, Danish cabbages, and Hungarian beans.

The medicinal qualities of vegetables are known but little — they vary according to the soil and method of cooking and serving. A

tithe of the money now expended on patent medicines, spent in experiments would determine these qualities. Celery, some physicians say, has an undeserved reputation for relieving rheumatism; lettuce is supposed to quiet the nerves; spinach the French call the broom of the stomach; but who knows whether these claims are valid?

It has been worth while to study fermentation thoroughly because an immense amount of capital is invested in breweries. Cattle foods are investigated because they are a large expense to the farmers. Might not equal profit accrue from a thorough study of changes which take place in vegetable foods between the garden and the table?

So far as the nutritive value of the food is concerned, all efforts of horticulturists are useless unless these products are treated properly in the kitchen.

One of our New England agricultural reports recently contained many photographs showing the effect of different fertilizing agents on common crops. Why should not our agricultural experiment stations study different methods of cooking these foods, and tell us when and how to use soda and acids to soften the tough fibres of vegetables; when cold water is best and the effect of different degrees of temperature; how to treat the same vegetable at different stages of its growth; whether anything is gained from the action of diastase by soaking seeds before cooking; and a thousand other questions which perplex the cooks?

You may say these are questions for the cook to settle, but the farmer has an agricultural experiment station in each State with skilled chemists and biologists, and all the apparatus needed for such experiments. Why should they not do a little for the cook? The government holds schools and institutes for the teacher and for the farmer, why not for the housekeeper? Why is there not a chair of domestic science in all our New England agricultural colleges as well as in the West? Why should not the fairs offer premiums for cooked vegetables, or give lessons in this branch of cookery?

"The present need in this country is not so much of instruction how to earn as how to spend an income, especially a small one." [1]

[1] Edward Atkinson.

Discussion.

A lady asked, Did you say that no member of the cabbage family is poisonous? If so, how about the skunk cabbage?

Miss Barrows answered that that plant is not botanically related to the cabbage of our gardens, but belongs to the Arum family, and is closely related to the Jack-in-the-Pulpit.

In answer to another lady, who inquired about books, Miss Barrows said there are several that are helpful, but we need more. W. Mattieu's "Chemistry of Cookery" and Yeo's "Food in Health and Disease," which was quoted this morning, are among the best. She was convinced that writers on cookery do not know as much about vegetables as about meats. She would discourage the use of canned vegetables when fresh ones can be procured. There are all kinds and conditions of onions in the market. There is, as a result, a great difference in the time required for cooking and in the flavor; she advised changing the water occasionally. In reply to an inquiry whether young milkweeds are good for greens she said that they are, as also purslane and mustard.

President Appleton said he thought this was a field for ladies to work upon, and he would like to see a list of the plants which might be used. We want more definite knowledge of the changes undergone in vegetable substances in cooking.

Miss Barrows said asparagus beds are few and far between in farming communities. Swiss chard is seen occasionally in Boston markets.

Benjamin W. Putnam had grown Swiss chard in his garden; it will suit those who argue that we should eat only what grows above ground. A single plant will furnish enough for a family. It is our business as market gardeners to furnish what the public want. Prizetaker onions are said to weigh three or four pounds each.

Miss Barrows replied that the onions raised here are generally reputed coarse, and stronger than those from milder climates. Our cooks want an onion that will cook quickly.

Vice-President Ware thought the Danvers onion the most productive and having the best keeping qualities, but that it is not a desirable table onion. If one wishes to grow onions in a garden for his own use he should raise the Cracker onion.

Mrs. Lincoln asked why we should have nails in celery?

A celery grower stated that all that have gone from his place lately have been tied with matting instead of being nailed.

President Appleton said we want to do all we can to raise the standard of quality. We want to keep out the Bermuda onion by raising as good ones here.

Vice-President Ware wanted to emphasize the importance of the home garden. He undertook to say that if they do justice to the garden, the farmer and market gardener can supply better food for their families than any one else. For sweet corn and green peas, do not rely on one planting; plant every ten days. It is your duty to provide for your families.

Miss Barrows said the discussion on onions had brought out the point she made, that market gardeners do not raise the finest kinds.

Miss Bedford, of New York, was quoted as having a lecture on the neglected vegetables.

A gentleman mentioned using hogbrake, leaves of dog-tooth violets, and *Clintonia borealis*. Another said that more Egyptian onions are brought here than Bermudas, etc.

MEETING FOR LECTURE AND DISCUSSION.

Saturday, March 13, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President Charles H. B. Breck in the chair.

The following paper was read by the author:

Horticulture in Canada.

By Professor William Saunders, LL.D., Director of the Dominion Experimental Farm, Ottawa, Canada.

The subject which I have the privilege of bringing before you on this occasion is that of Horticulture in Canada, and in the discussion of this topic it is my purpose to treat of horticulture in its widest sense, as embracing the art and science of the cultivation of trees, shrubs, and plants for both utilitarian and decorative

purposes. This subject covers so wide a field that the brief period of an hour will admit of touching on but a few of its more important features, and, with the view of presenting these in a clear and intelligent manner, I shall first give you a very short sketch of the country whose horticultural progress I am expected to outline.

The Dominion of Canada consists of seven provinces, four provisional territories, and a vast area to the north, much of which is yet unexplored. If the traveller through this country takes the train at its eastern boundary, at Halifax on the broad Atlantic, he may ride with one change of cars through to the shores of the Pacific, covering a distance of three thousand six hundred and sixty-two miles, and all within the settled area of Canada. The three most easterly provinces form a group partly surrounded and more or less intersected by the ocean, known as the Maritime Provinces. Following these come the goodly provinces of Quebec and Ontario, the latter stretching westward along the margins of the Great Lakes — Ontario, Erie, Huron, and Superior — until its western boundary is found beyond the Lake of the Woods. Here Ontario joins the "prairie province" of Manitoba, west of which lie the four gigantic provisional territories, — Assiniboia, Saskatchewan, Alberta, and Athabasca, — comprising vast plains. In a part of the territories a wide belt of the country, lying north of the 49th parallel, — which forms the boundary line between the United States and Canada, — has a dry climate, caused by the hot winds which blow northward from the great American desert. But beyond the spent force of these hot currents, beginning from one hundred and twenty-five to one hundred and seventy-five miles north of the boundary, we find immense partly wooded areas, watered by streams flowing northward, with a soil wonderfully rich and fertile and with conditions favorable for mixed farming, especially for the raising of cattle and for dairying. Still further west stands British Columbia with its sea of mountains enclosing an area abounding in minerals, coal, and lumber. Its waters teem with fish, and some of the fertile valleys are being fast converted into smiling fields of grain and prolific orchards.

Let us touch briefly on the conditions found in each of the divisions of this your neighboring country, and note the indications of horticultural progress. Prince Edward Island, the

smallest of the provinces of Canada, has an area of two thousand one hundred and thirty-three square miles, is one hundred and fifty miles long and varies from nine to thirty miles in width, and has a population of one hundred and ten thousand. This island has a fertile soil; the climate is cool and bracing in summer, but rather severe in winter. Many varieties of apples, plums, and cherries succeed well there, and gooseberries, currants, and other small fruits are produced in abundance; but the winter season is too severe to admit of growing the more tender fruits successfully. The cultivation of flowers is very general, especially in the cities and towns, in which many avenues of stately trees are found, most of which are European. So also are the shrubs which decorate the grounds about rural and city homes. The number of varieties of trees grown are few, and in shrubs one notices the absence of many beautiful forms which are grown very successfully in other provinces, and which will, no doubt, when introduced, do well here. Horticulture is encouraged by the holding of exhibitions of fruits and flowers in the capital at Charlottetown and elsewhere, which are assisted by grants from the provincial treasury. There is a fine park in Charlottetown, comprising about one hundred and fifty acres, with beautiful drives through the wooded areas and along the seashore, — a cool and delightful place of resort for the citizens throughout the summer months.

Across the Northumberland Straits from Charlottetown, some thirty miles distant, lies the Province of Nova Scotia, with its twenty thousand five hundred and fifty square miles of area and a population of four hundred and fifty-one thousand. The climate of the eastern part of this province is mild and well adapted for the growing of many varieties of fruit of high quality and in great perfection. The Annapolis valley, so well known as the scene of Longfellow's beautiful and tragic poem, is specially adapted by climate and situation for fruit growing, and is rapidly being converted into a vast orchard where the choicest sorts of apples, pears, plums, and cherries grow in the greatest abundance. In this valley there is a special school of horticulture, receiving a liberal provincial grant, where practical training is given to students in the propagation and growth of fruits, ornamental shrubs, trees, and flowers. To drive among the beautiful scenes in that charming valley, when the trees are

covered with blossoms in the spring, or when their branches are pendant with golden fruit in the autumn, is a delight not soon to be forgotten. There are many other localities in Nova Scotia where fruit culture is carried on very successfully, and the exports of fruit from this province are large and constantly increasing. The Fruit Growers' Association of Nova Scotia, which is also aided by provincial funds, is a strong and active organization, holding meetings at intervals during the year for the discussion of subjects relating to fruit growing and other branches of horticulture, and the information brought out is published in the proceedings of the Association. During the past year the quantity of apples exported was about five hundred thousand barrels. Some of this fruit, I am told, finds its way to Boston, where the high-flavored Gravensteins are said to be much appreciated; but much the larger portion finds a ready market in the larger cities in Great Britain. In Halifax there are several parks, including in all about two hundred and eighty acres. The Public Gardens, containing about sixteen acres, are also very attractive and contain some excellent specimens of trees, mostly European, and many varieties of shrubs and conifers, including some choice specimens of Japanese Retinosporas, notably of *Chamæcyparis plumosa* and *C. plumosa aurea.* The Scotch heather, *Calluna vulgaris*, also luxuriates here, and some of the fine flower beds are margined with this pretty plant, which has become naturalized and is growing in large patches in the public parks. Truro and other smaller cities and towns west of Halifax are emulating the capital in the establishment of parks, adorning their streets with avenues of trees, and embellishing their homes with groups of choice shrubs and beds of flowers.

In New Brunswick, with an area of twenty-eight thousand square miles and a population of three hundred and twenty-one thousand, the climate is not so favorable for general progress in horticulture as in the sister province of Nova Scotia. While orchards have been successfully established in the valley of the St. John river, the varieties of fruit grown are chiefly of the hardier sorts, and the cultivation of large fruits is not general. Small fruits, however, are grown in abundance, and the cool weather in early summer retards the ripening season and permits of the growing of large quantities of luscious strawberries, which,

ripening after the main supplies in the New England States, find a ready market in Boston and other cities, with but little competition and at good prices.

Recently a public park comprising two hundred and forty acres has been established at the city of St. John, occupying a commanding position overlooking the turbulent waters of the Bay of Fundy. Through this park roads are being laid out amidst charming and, in some places, rugged scenery. This must in time become a most attractive place of resort.

The Province of Quebec, with an area of two hundred and twenty-seven thousand square miles and a population of about one and one-half million, is also making progress in horticulture. In the valley of the St. Lawrence there are many fine orchards, and nowhere does the celebrated Fameuse apple reach so high a degree of perfection as on the Island of Montreal, where many varieties of pears also, and plums of fine flavor, thrive well. In the eastern townships, on the south side of the river St. Lawrence, fruit growing is carried on to a considerable extent and quantities of apples from this territory find their way to Montreal or are shipped to foreign markets; but on the interior lands, on the north side of the river, only the hardier fruits succeed, and the orchards are few and small. In Montreal and other cities and towns in this province, much taste is displayed in the laying out of the public parks and squares, and in the ornamentation of the grounds of the more wealthy members of the community. Horticultural societies and a Provincial Fruit Growers' Association have been organized, which are aided by provincial funds; annual exhibitions are held, and thus the love for the cultivation of fruits and flowers is fostered.

Ontario is the banner province of the Dominion, and its wonderful variety of climate and rich horticultural possibilities are as yet but partially known. With the noble area of two hundred and twenty thousand square miles, and a population of two million one hundred and fifteen thousand, this province has twelve and a half million acres of cleared land, about three hundred and twenty thousand acres of which are under orchard, garden, and vineyard. The number of apple trees of bearing age in this province is about six millions, while there are three and a half millions more of younger trees, most of which will soon be in bearing condition. The yield of apples in 1896 was

very large, and is estimated at fifty-six million bushels. In the Niagara peninsula, and along the shores of the western part of Lake Erie, peaches are grown very successfully, and there are said to be over half a million of peach trees planted in that part of Canada. Grapes, also, are grown in immense quantities. There are about three million of bearing grape vines in Ontario, producing annually about fifteen million pounds of grapes. There are also large orchards of pears, plums, and cherries, so that Canadian markets are well supplied with home-grown fruits of excellent quality throughout the season, and a large quantity of apples is exported to Great Britain. During the past year more than two million barrels were exported from Montreal. Ontario also sends large supplies of fruit to the prairie districts in the west. A thriving organization, known as the Fruit Growers' Association of Ontario, has been in existence for the past twenty-eight years, and has done much to stimulate fruit growing throughout the province, and also to cultivate a taste for ornamental trees, shrubs, and flowers. This Association receives a liberal annual grant from the provincial funds. The large display of fruit and flowers at the leading annual exhibitions helps to draw further attention to these interesting and important subjects. The Ontario government also gives annual grants towards the support of horticultural societies, which are established in most of the towns and cities of the province. Under this stimulus, frequent floral exhibitions have been held, and the people have been led to vie with each other in beautifying their homes by the planting of trees and flowers. Many large floral establishments are well supported by lovers of flowers. In the cities and larger towns public parks have been established, valuable not only as health resorts, but as repositories for some of nature's choicest arboreal gifts.[1] Horticulture also forms an important part in the curriculum of the Ontario College of Agriculture, which is located at Guelph.

Adjoining Ontario at its western extremity is the Province of Manitoba, with sixty-four thousand square miles of territory and a population of one hundred and fifty-two thousand. Here the climatic conditions are too severe to admit of the rapid extension

[1] The lecture was illustrated with lantern slides, showing scenes in the public parks and gardens in the different cities in the Dominion; also views of many beautiful individual specimens of ornamental trees and shrubs grown on the experimental farms.

of horticulture. The larger fruits are not successfully grown, but many of the small fruits are produced in abundance. The people are everywhere fond of flowers, and the long days and abundance of sunshine in the summer months give a wealth of bloom to many annuals and hardy perennials unknown in eastern climates.

Westward of Manitoba lie the four organized territories of the Canadian Northwest — Assiniboia, with an area of eighty-eight thousand square miles; Saskatchewan, one hundred and one thousand; Alberta, one hundred and five thousand; and Athabasca, one hundred and three thousand. These great divisions extend from the western boundary of Manitoba to the Rocky Mountains, are partly traversed by railways, which have opened up the country for settlement, and a sparse population of from fifty thousand to sixty thousand people is scattered here and there throughout this very large area. The love of trees, shrubs, and flowers is universal on the plains, and luxuriant gardens full of bloom are frequently found among the settlers. In the country to the north lie the unsurveyed and but partly explored districts, occupied only, as yet, by widely distant trading posts and occasional settlers, but mainly in possession of Indians and fur-traders. In this wide expanse are included the districts of Ungava, Keewatin, Franklin, Mackenzie, and Yukon, comprising in all about a million and a half square miles, exclusive of the water areas.

The most westerly province, British Columbia, includes three hundred and eighty-two thousand square miles and has a population of about one hundred and twenty-five thousand. In the busy mining districts not much attention is paid to horticulture, but west of the Coast Range of mountains, where the climate is mild and genial, much like that of England, fruits and flowers grow in profusion. There the holly, laurel, rhododendron, and yew flourish with the apple, pear, plum, and cherry, and, in some localities, the peach. In those parts of the province between the Coast Range and the Rockies there are many fine valleys, some of which have not sufficient rainfall to admit of the successful cultivation either of grain or fruit without irrigation. There are, however, many mountain streams available for this purpose and on some of the ranches very fine apples are grown. The taste for flowers is almost universal, and the long, mild season permits of

many of them being grown in perfection. This province has also a Fruit Growers' Association, assisted by a grant from the public purse, and exhibitions of fruits and flowers are held annually in the larger towns and cities. Vancouver and Victoria have both very fine public parks.

The progress of horticulture, as well as agriculture, throughout Canada has been greatly stimulated by the organization and maintenance of experimental farms by the Dominion Government. Ten years ago this good work was begun, and while the greater attention has been given to measures looking towards the improvement of farming, many lines of horticultural work have been vigorously prosecuted. These experimental farms are five in number, the central or principal farm being located at Ottawa, the seat of government, — where, on the boundary line between Ontario and Quebec, it serves the purposes of these two important provinces, — and the four branch farms in the more distant provinces of the Dominion. A site was chosen for one of these at Nappan, in Nova Scotia, near the dividing line between that Province and New Brunswick, where it ministers to the needs of the three Maritime Provinces. One was located near Brandon, in the central part of Manitoba. A third was placed at Indian Head, a small town on the Canadian Pacific Railway, in Assiniboia, one of the Northwest Territories; and the fourth at Agassiz, in the coast climate of British Columbia. The climatic conditions prevailing at these several points are all very different, and each location in this respect fairly represents a large area.

At each of these farms, orchards and fruit plantations have been established and a large number of varieties of fruits tested, while similar experimental work has been carried on with many different sorts of ornamental trees, shrubs, and flowers. The selections made in each case have been of such varieties as were thought to be most likely to succeed in the climates in which they were to be tried. In the Maritime Provinces the climate resembles that of many parts of New England, and the branch experimental farm at Nappan occupies a fairly representative position. The climate is milder and more moist than that of Ottawa, and all the varieties of trees and shrubs which succeed at the central farm do quite as well, or better, at Nappan, and many varieties of fruits which thrive in Nova Scotia are not able to endure the more severe winters at Ottawa. At this eastern branch farm

there are now nearly four hundred varieties of large and small fruits under trial and about three hundred varieties of ornamental trees and shrubs, and most of these are making satisfactory growth. Many additions are made to these lists every year. Already these plantations are proving a useful guide to the people in the Maritime Provinces, whether they desire to grow fruit or to beautify their homes by ornamental planting.

Passing now at one bound over a distance of seven hundred and forty-two miles west of Nappan, we find ourselves at Ottawa, the capital. Three miles from the centre of the city lies the central experimental farm, consisting of four hundred and sixty-five acres. Ten years ago this land was liberally sprinkled with stumps and stones, and encumbered with one hundred and forty acres of second-growth timber and forty acres of swamp. This has all been cleared and reclaimed, and brought into a fair condition of cultivation. About three hundred and thirty acres are devoted to agricultural work, thirty-five acres to the testing of fruits and vegetables, twenty-one acres to experiments with forest trees, nine acres to ornamental planting along the margins of the roads and about the buildings, and sixty-five acres to an arboretum and botanic garden.

There is an office building with chemical laboratory below, and overhead a museum of farm products, in which the fruits grown at the several farms make a striking display. Near by are the houses of the chemist, botanist, and horticulturist, about which there are some pretty groups of trees and shrubs.

The conservatory consists of two glass structures, each seventy-five feet long, in one of which there is a fair collection of economic and ornamental plants. In the list of the former will be found tea, coffee, cinnamon, camphor, pepper, cinchona, cocoa and other plants serviceable to man. There are also collections of orchids and cacti, with palms and ferns and many of the commoner house plants. Another house is used, during the early months of the year, for testing the vitality of seed grain for farmers and for general propagating purposes.

The barn with adjacent planting shows that the surroundings of even a barn may be made attractive by a judicious use of trees and shrubs.

Orchards have been planted and are used for testing fruits, and the number of varieties of large fruits under trial here is about

eight hundred, and of small fruits about as many more. Many new varieties have been produced on the farm, by growing large numbers of seedlings of choice sorts and selecting the best, and by cross-fertilization. Comparative tests have also been made of a large number of vegetables.

A useful adjunct to the horticultural department is the apiary, where the busy bees work all the summer day, gathering stores of honey from the flowers of various plants and trees, and in carrying on their regular work render valued assistance in fertilizing the blossoms of fruits.

Some people object to planting trees, fearing they may not live long enough to realize much enjoyment from them.[1] To produce the best results comparatively small specimens should be selected. A young and thrifty tree accommodates itself to change of location much more readily than an older one, and the young tree usually develops its normal form more perfectly.

During the early years of our work collections of bulbs — including lilies, hyacinths, narcissus, and many other sorts — were planted in the autumn; but the ground being open and without shelter, the snow at times was so blown off the ground as to leave it nearly bare and most of the bulbs were killed during the winter. To provide shelter, and collect and retain snow over them, an enclosure hedged with arbor vitæ and Norway spruce was planned and the bulbs planted within it; since then nearly all have wintered well. During the winter the enclosure and its surroundings are protected by snow, which gathers within and about it to a considerable depth. The evergreen margin is now about three and a half feet high, and portions of it are almost covered with snow during the colder part of the season.

The beds outside this enclosure afford different aspects, which make them very suitable for certain classes of plants.

Within, a constant succession of bloom during the summer is maintained: hyacinths, tulips, and other bulbs in the spring, and later fine masses of lilies, herbaceous peonies, and irises are grown.

The lilacs, when in bloom in the spring, are among the most beautiful of shrubs, and what delightful improvements have of late been made in this old-fashioned favorite! More than sixty

[1] Views were shown to demonstrate the development in growth and beauty which can be made in a brief period of seven or eight years.

varieties are under test at Ottawa, and nearly all are doing well. Charles the Tenth is one of the best; it is very rich in color, a wonderfully free bloomer, and the clusters of flowers are large. Alba grandiflora is also a good variety; its large white flower clusters contrasting with the rich deep green foliage make it very attractive.

A group of Scotch Pines, *Pinus sylvestris*, is a prominent feature in one part of the grounds; this was planted eight years ago. The trees were then eighteen inches high; now they measure from thirteen to fourteen feet. The rich green color of this species, which is well preserved throughout the winter, makes this tree an attractive object at all seasons of the year.

The Rocky Mountain Blue Spruce, *Picea pungens*, is one of the most valuable introductions of late years, and ranks among the most beautiful of hardy evergreens. The foliage in some specimens assumes a rich shade of steely blue, most striking in the early part of the summer. Many of these trees have been planted in different exposures on the central farm, during the past seven years, and all have proved perfectly hardy.

The European Mountain Ash, or Rowan Tree, *Pyrus Aucuparia*, is a fine object on the lawn when well-grown and clothed with branches to near the ground. Its beautiful foliage and abundant clusters of white blossoms in the spring, succeeded by bunches of scarlet berries in the autumn, make it attractive all through the season.

The Katsura Tree, *Cercidiphyllum Japonicum*, from northern Japan, is an interesting tree, which is quite hardy at Ottawa. The unique character of its foliage as well as its handsome form render it most desirable.

The Sweet Chestnut, *Castanea sativa* var. *Americana*, is a native of the western part of Ontario and is grown with some difficulty in the climate of Ottawa. After several failures, two or three trees have now become established and are doing well. One of these blossomed last spring.

The variegated Dogwood, *Cornus mas* var. *variegata*, is one of the most beautiful shrubs at all seasons of the year. The foliage is richly variegated with white and the variegation is well maintained throughout the season.

When speaking of the divisions made of the land at the central farm and the purposes to which the several portions

were devoted, I stated that sixty-five acres had been set aside for an arboretum and botanic garden devoted to the testing of trees, shrubs, and plants from all parts of the world. Work was begun in this branch six years ago, and already nearly two thousand species and varieties of trees and shrubs, and about one thousand of herbaceous perennials, have been brought together from all the northern sections of the globe and are being tested as to their suitability for the climate of Ottawa. Canada was for a long time the only important British colony without a botanic garden. This stigma has now been removed, and it is hoped that this institution at the farm will soon reach that stage of advancement which will make it a credit to the country.

Permit me to direct your attention for a short time to a few of the individual specimens on this part of the grounds:

The European Larch, *Larix Europea*, is a very handsome tree, valuable for its timber. It is a rapid grower and has a most graceful drooping habit.

The Golden Arbor Vitæ is a beautiful form of the common Arbor Vitæ, *Thuya occidentalis*, in which the foliage assumes a golden yellow hue. This is a brilliant object for a lawn and makes a beautiful hedge.

The Pyramidal Arbor Vitæ is another interesting form of the same species, quite pillar-like in its growth.

The Austrian Pine, *Pinus Austriaca*, is a stately evergreen, of fine form and habit, very hardy, and a fairly vigorous grower. A tree in the Arboretum which when planted six years ago was eighteen inches high now stands about seven feet.

The Norway or Red Pine, *Pinus resinosa*, has also a stately habit, but is of softer outline than the Austrian Pine and makes a handsome tree.

The Mountain Pine, *Pinus Montana*, is a very desirable object for a lawn. Its low-growing, bushy habit, with branches close to the ground, makes it well adapted for localities where space is limited.

The Tartarian or Bush Honeysuckle is a free-flowering shrub and one of the earliest to bloom in the spring, and when covered with its pink or white flowers, or later with its bright-colored berries, is very pretty.

Van Houtte's Spiræa, *Spiræa Van Houttei*, is a lovely shrub, which, during the latter part of May and early in June, is

literally covered with masses of white bloom. In growth it has a pendulous habit and is very graceful in form.

Spiræa Bumalda is another species of the same genus, which has an upright form. This is also a free bloomer and is very attractive.

The Weigelas are very beautiful shrubs which are not entirely hardy at Ottawa, the new wood being usually killed back more or less by the severe weather in winter. In most instances, however, a sufficient quantity of the wood survives to give a considerable amount of bloom. Siebold's Variegated Weigela has proved one of the hardiest forms at the central farm. It blooms abundantly in its season, and its variegated foliage makes it at all times very attractive.

The different species and varieties of Philadelphus (known also as Syringa and Mock Orange) are charming objects for the flower border, and quite hardy. The flowers vary in size from one to two inches across; some of them are single and some double; most of the varieties are richly perfumed.

The Snowball, *Viburnum opulus* var. *sterilis*, is an old-fashioned, but most desirable species for the shrubbery. During the blooming season it is literally covered with masses of snow-white bloom. *V. lantana* and *V. dentatum* are also very valuable hardy ornamental shrubs.

The Siberian Cornus, *Cornus alba* var. *Sibirica*, is another very useful and hardy sort. It is a pretty shrub when covered with its flat, white clusters of bloom in June; and when devoid of foliage during the winter, its brilliant red stems form a beautiful contrast with the white background of snow.

The Russian Olive, said to be a hardy form of *Elæagnus hortensis* var. *angustifolia*, is a small tree of very graceful habit, with foliage and branches of a charming silvery hue, which is best brought out where it has a background of dark green growth. This is a very hardy tree and endures the severe climate of the northwest plains well, and when in bloom its numerous small yellow flowers fill the air with their fragance.

Later in the season the Japanese Hydrangea, *Hydrangea paniculata* var. *grandiflora*, becomes a very prominent object in the collection of shrubs, from the large bunches of flowers so freely produced at the ends of the branches. This species has found its way into public favor very rapidly. Only twenty-three

years have passed since this shrub was first introduced from Japan, and during that comparatively brief period its merits have been universally recognized and it has become one of the most widely distributed and favorite shrubs in cultivation.

Populus Berolinensis is a Russian Poplar and one of the hardiest species tested. It endures the climate in all parts of Canada well, making a strong and rapid growth. Many thousand cuttings of this tree have been sent out from the experimental farms to settlers in different parts of the Canadian Northwest. These strike readily and soon form handsome trees, wind-breaks, or hedges. A specimen which was planted in the arboretum at Ottawa six years ago as a small tree now stands over twenty-five feet high.

Many inquiries are made every year as to the best sorts of shrubs or trees to plant for hedges. To gain experience and furnish object lessons, many different sorts are being tested for this purpose. Seventy-five varieties have already been planted as sample hedges, each fifty feet long, and a large proportion of them have had five or six years' growth. These are proving an attractive feature in connection with the ornamental planting at the central farm.

A journey of one thousand four hundred and thirty-seven miles west, by the Canadian Pacific Railway, brings us to the flourishing town of Brandon, in Manitoba, adjoining which is the experimental farm for that province. It is located partly in the valley of the Assiniboine river and partly on the heights above the bluffs which margin the valley. This farm has been greatly improved by the planting of trees, about sixty-five thousand of which have been put out in avenues, shelter belts, clumps, and hedges. Most of the hedges have been planted with quick-growing trees, such as poplars and willows, and enclose good-sized plots of ground. These hedges grow quite tall and act as wind-breaks during the summer and help to collect large banks of snow in the winter, which, on melting, leaves the ground in a very favorable condition of moisture. These plantations have placed examples before the settlers, which many have been induced to follow, and this incentive has produced gratifying results. Tree planting has been further stimulated by free distributions of tree seeds, large quantities of which have been collected, especially of the Box Elder, *Negundo aceroides*, and

the Green Ash, *Fraxinus viridis*. These seeds have been hitherto collected in the river valleys and ravines in the bluffs in Manitoba and the Territories, and during the past seven years more than five tons of such seeds have been distributed free by mail, and during the same period about six thousand packages of young forest trees and cuttings have been sent out in the same way to settlers in that country. Last year the native trees planted on the two western experimental farms produced seed freely, and more than a ton of this has been collected for distribution during the coming season. An arboretum has been started at Brandon, and there are more than one hundred species and varieties of trees and shrubs in it which have proved hardy, and many more are under test. A large number of varieties of flowers have also been tried. Nearly all the annuals do well, and the large amount of sunshine they enjoy there brings many of the species to a higher degree of perfection and results in a greater abundance of bloom than is usually found in the east. In perennials, the hardy list includes Tulips, Herbaceous Peonies, several species of Iris, Hemerocallis, Aquilegia, Aconite, Delphinium, and many others. The love of flowers among the people is very general, and many take great pride in their gardens.

While most of the hardier varieties of small fruits, such as raspberries, currants, and gooseberries, are grown with success, all attempts to grow the larger fruits produced in the east, such as apples, crab apples, pears, plums, and cherries, have failed; the trees do not endure the climate. There is, however, one small wild crab, *Pyrus baccata*, with a fruit about the size of a large cherry, which has been obtained from the northern part of Siberia, that has proved perfectly hardy, having stood four or five winters without showing any sign of winter killing. This bears fruit very freely, and notwithstanding their diminutive size these tiny apples make excellent jelly, and in their present unimproved state would be much appreciated. Efforts are, however, being made to improve this small crab by cross-fertilizing it with many of the hardiest sorts of apples. A large number of these cross-bred seedlings will be ready for planting on the northwest farms in another year. Suitable enclosures are being prepared which will afford the young trees some protection and within two or three years it is expected that some of these will bear fruit. Similar experiments have also been carried on with

Pyrus baccata prunifolia, which has also stood one winter in the northwest without injury, and this fruit is about double the size of that of *P. baccata*. It is probable that some of these cross-bred seedlings will bear fruit of larger size and improved quality, which will be valuable to the settlers there. These trees are both small and low-branched and well adapted to endure the climatic conditions prevailing in the prairie country.

The wild Plum, *Prunus Americana*, is found native in different parts of Manitoba and is common in the valley of the Assiniboine river and in the other river valleys in the southern part of that province. The fruit varies much in size, color, and quality, some trees producing red fruit and others yellow, and while some of the fruit is but slightly astringent and of fair quality, other samples are scarcely edible. Efforts are being made to improve the wild plum by selection from seedlings grown from the best varieties. It is proposed also to follow this up by cross-fertilizing with better sorts.

The Sand Cherry, *Prunus pumila*, is also a native of the far west. It is common about the Lake of the Woods and has been found on the prairies as far west as the 108th meridian, and as far north as Prince Albert, which is about three hundred miles north of the United States boundary. The Sand Cherry is a very variable fruit; the commoner forms are about the size of a large Marrowfat Pea, with a disproportionately large stone and astringent flesh, while occasional bushes are found bearing fruit as large as the English Morello Cherry, with a much larger proportion of pulp to stone and a superior quality of flesh. Fruits subject to such free variations in the wild state may be expected to improve still more, in size and quality, under the influences attending higher cultivation and cross-fertilizing. It is believed that the prospects in connection with the efforts which are being made to improve the fruits referred to are hopeful, and that there will in time be produced such varieties as will prove useful fruits to the people of the northwest country.

A further journey of one hundred and eighty-five miles over the plains brings us to the experimental farm at Indian Head, in Assiniboia, one of the Northwest Territories. This farm is about the same size as that at Brandon, viz., six hundred and eighty acres. When this land was purchased it was a piece of bare prairie, without tree or bush. During the eight years it

has been occupied tree planting on a rather large scale has been carried on, and there are now growing on this farm, in shelter belts, blocks, avenues, wind-breaks, and hedges, more than one hundred thousand trees. Difficulties were encountered at first from the very strong winds, which gave the trees a stunted appearance, but these obstacles were gradually overcome and the trees have now made such a free growth that they protect one another, producing a vast improvement in the appearance of the place, and affording much shelter.

Although the climate is more severe here, the experiences had with fruit trees and with forest and ornamental trees, as well as with flowers, are nearly the same as those which have been gained at Brandon.

A further railway ride of five hundred and fifty miles from Indian Head brings us to the end of the one thousand miles of plains which stretch from the easterly part of Manitoba to the Rocky mountains, and now we find ourselves ascending among the foot-hills, the landscape broken into bluffs and valleys with clumps of wood and park-like openings between them, and after two or three hours more of journeying, Banff, where the Canadian government has established a national park, is reached. It nestles among the mountains, and the efforts to improve this beautiful spot have been mainly in the way of making roads so as to open up the romantic beauties of the place, and render those points which afford the most striking views easily accessible. As we approach this elegant resting place for tourists, we pass the "Three Sisters," a lovely group of mountains; also the Cascade mountain, whose bold rocky summit rises abruptly from near the railroad track more than five thousand feet above the valley. This mountain derives its name from a small cascade which dashes down the mountain side, in which it has worn a distinct channel. Some of the most lovely views to be had anywhere in the mountains are to be seen at Banff, where there is a delightful combination of mountain, water, and forest. A museum has been established here by the government, which contains collections of the mammals, birds, and plants found in the national park.

There are also some beautiful lakes in this neighborhood. Lake Louise is one of the prettiest. The bright green color of its waters contrasts strongly with the pure white of the glaciers beyond, while the many-hued cliffs, with various shades of brown

on the one side and the deep green of the spruce-clad banks on the other, all help to form a most harmonious and striking picture. Near by, but about a thousand feet higher, Lake Agnes bursts upon the view, with wilder and totally different surroundings.

One more stretch of about four hundred and eighty miles, through wonderfully varied mountain and valley scenery, takes us through to the valleys and delta lands of the coast line. Here we have the coast climate, which, on this part of the shore of the Pacific, is cool in summer and mild and moist in winter; but returning eastward towards the interior, it becomes hotter in summer and colder in winter, with less rain.

At Agassiz, seventy miles east of the ocean, the most westerly of the experimental farms is located, in the valley of the Fraser river. Seven years ago this place was a wilderness. Now there are one hundred and thirty acres of land cleared and under cultivation, and about half of it has been planted to fruit, and more than two thousand varieties of fruits are under test there, nearly all of which are doing well. The climate is mild, and suitable for this industry, and nowhere do the plum, apple, cherry, and pear bear fruit in greater profusion. Every variety likely to be of benefit to the country is being tested, so that the fullest information may be available to the settlers as to the best and most profitable varieties to plant.

All sorts of small fruits succeed remarkably well here. A very large number of ornamental trees and shrubs are also successfully grown, including some of the more tender varieties, which are not hardy at Ottawa. Flowers also succeed admirably in this moist climate. The Japanese and other lilies grow luxuriantly, and during the flowering season they fill the air with their fragrance.

I must not trespass further on your time. I have but touched here and there on the almost limitless field covered by my subject. I hope, however, that I have succeeded in showing that horticulture is not entirely neglected in Canada, but that individuals, communities, and governments (both Provincial and Dominion) from one end of the country to the other are striving to help along this good work. While we cannot expect soon to reach that degree of horticultural advancement which we see and admire so much in older and wealthier communities like

your own, we are striving to follow in a measure your noble example and to profit by the generous help which you are always ready to give. Your Arnold Arboretum has aided our experimental farm work in a princely manner, and your ever welcome publications are a constant stimulus towards progress. Although not under quite the same form of government, we are of the same stock as yourselves, and the love for and appreciation of the marvellous beauties of nature brings like pleasure wherever we dwell, whether we acknowledge as our ruler a worthy president or a matchless queen. Horticulture is bounded by no political lines, but in every community where the mind is sufficiently cultured to appreciate the wonderful beauties with which the world is studded, there these lovely trees and shrubs and flowers, which combine so much of grace and beauty, become a perennial source of quiet delight. They are but expressions of the thoughts of the great Creator, who established and sustains the laws which govern their growth and development. Some love for the beautiful in nature is found in almost every breast, and companionship with such charming objects tends to deepen and enlarge that feeling of admiration, to elevate our thoughts and lead them from Nature up to Nature's God. Their beauty is inspiring, and while we study them we catch the spirit and gladly follow the teaching of the great Master in his inimitable Sermon on the Mount, when, gazing on the lovely flowers growing around him, with the deepest insight into the perfection of their beauty, he exhorted his hearers to "Consider the lilies of the field how they grow. . . . I say unto you that even Solomon in all his glory was not arrayed like one of these."

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 20, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following paper was read by the author:

SOILS AND POTTING.

By T. D. HATFIELD, of Wellesley.

The subject which your Committee on Lectures has been kind enough to choose for me is generally considered by gardeners as the most important one they have to deal with. This is true, but we must not narrow the question down to one simply of gardeners' methods, for many of us are farmers as well, cultivating a great variety of plants, and we wish to consider whatever in this connection affects our material welfare.

Gardeners seldom fully agree about the proper soil for any crop. Few of us find ourselves having the same conditions of soil to deal with. Our soil may be heavy or light, the land high or low, and with every variation of exposure. We go from one place to another, and often wonder at our neighbor's success when we should consider failure certain. I have received plants with the soil so stiff that I wondered how they ever dried out when once wet; and from another place where the soil would appear to be about the same as our swamp mud. An acquaintance of mine tells me that at one place where he was gardener, in the neighborhood of Cape Ann, the only bit of potting soil he could find was turf from what had at some time been a salt marsh. After it was broken up, and the air and frost went through it, he found he could grow almost anything, from a geranium up to an azalea. Everybody finds a way of dealing with the problem before him.

Sometimes we find ourselves with a garden lot so springy that nothing can be done in the way of cultivating it until very late in the season, and again with a soil so dry that we must irrigate for all except early crops. A dry soil is easily worked, but more difficult to keep in condition for supporting crops, because it holds sustenance poorly. Frequent manuring is required to keep it in

trim. For general purposes, probably a heavy soil is best. It is easy to make a part of the land light enough for a few early crops. Then a heavy soil holds manures better. By autumn plowing and cultivating the ground in plats, one can bring it into a good friable condition. We all know the value of a retentive soil in summer time. These general remarks have some bearing on what I shall say later.

We gardeners, taken together, are a conservative lot. We believe in "leaving well enough alone." It is a good policy, and one which carries much weight with it, and respect also. There are methods which we continue, often because it is the custom or practice to do so, and often we cannot explain why. Much experience is scratched up in a hand to hand sort of way; we find out as we must, and often we are obliged to experiment for ourselves, for the best practice of one does not always suit the case of the other. The gardeners of the United States have to thank the old-country gardeners, and many of us our old-country training; though much that we do here is done differently, yet an intelligent training helps us better to gauge our practice to the altered conditions, and these are principally of climate. Wrong we may be sometimes, and often too particular, but it is better always to err on the side of prudence.

Take the old books, and we shall read: "One-third of turfy loam, one-third of leaf soil, and a third of sand;" or it may be fourths, including rotted manure, or fifths, with peat added; but accurate measuring is tedious work, and too slow to suit Yankee ideas, so the tendency is toward simpler methods. As a matter of fact there are but few mixtures of soil in use today. Leaf soil, one of the best ingredients in any compost, is seldom used in any except private gardens. Many gardeners manage to get along without it. Well rotted manure is a good substitute, and in some cases is better. It is necessary, however, owing to the prevailing slipshod methods, that the soil should be light for potted plants. The man with a hose can over water with safety when the weather is hot, and the plants soon dry out, and when it is cold artificial heat has the same effect. But you cannot persuade the old-time gardeners to use the hose, though they may see that it really makes little difference, if ordinary care is used. Many plants set down as requiring heavy soil may be grown as well in a light soil. Wherever the rose grower is located, he finds means

of meeting the natural wants of his soil. He may add clay, but will not if he finds he can succeed without it, and he is almost sure to do so.

Take Azaleas. It used to be, and is yet in some places, considered necessary to import English peat in order to be successful with them. Ninety per cent of these beautiful hard-wooded plants are still grown in peaty soil in England. Nothing succeeds like success there as well as here, even though it be arbitration! If an English gardenerg rows good Azaleas in peaty soil he is not likely to change his practice. Ocular demonstration cannot be overcome, and if we will not be convinced by any other argument we must be by this. For instance, take a look at the Azaleas grown by Mr. Charles Sanders, gardener for Professor C. S. Sargent, of Brookline, and you will see that Azaleas can be grown in a soil almost wholly lacking peat.

This brings us to another part of the subject. The successful cultivator of plants finds there are other considerations almost as important as the soil and its consistency. I have tried all kinds of soil for Gloxinias, consulting this and that formula. I potted them in light soil, heavy soil, rich and poor, all to little advantage. With these handsome tuberous-rooted plants much depends on caring for the tubers during what is called the resting season, though they are never absolutely at rest and we make a mistake when we enforce it by removing the tubers from the soil in which they have been growing and storing them in dry sand, as is frequently the practice. They should never become thoroughly dry, for living roots will at all times be found, and these require some nourishment. It is important that we should start with sound, healthy roots, start them slowly by withholding water until some leaf growth is made, and at all times keep them near the light, though not in direct sunlight. If we attend to these essential conditions we shall find that Gloxinias succeed in almost any soil. Peat soil may be necessary for some Ferns, but almost all of them will thrive as well in good loam and leaf soil.

It may surprise you to know that I have but one compost heap, and that is seldom as good as I should like to have it. Good turfy loam is not as plentiful as I could wish, and though it is really the best, some of us have found out how to get along without it. The old country carnation growers are extremely careful when mixing their potting soil — a barrow full of this and that

and so much brick rubbish and charcoal; but the American grower prepares his in the field without a foot of turf; he must and so he does. He has several methods and perhaps the best and most common-sense one is to cultivate the area for stripping, growing thereon a crop of clover with no object beyond turning the best of what is put into the soil as manure into plant food of the kind which the Carnation most needs. The American grower raises more and better Carnations than his English compeer. He has, it is true, many advantages not possessed by the Briton. He has better light during the winter time, he has made a specialty of the work, and more than all, he has originated a new type of Carnations. What I have said about Carnation growing only goes to show that the importance of a prescribed composition of the soil is over-estimated.

I said I had only one compost heap; this is not quite true, for beside it I have a special one for Chrysanthemums. Perhaps I am fussy in this, as I don't think it makes much difference. I am fond of experiments and have made lots of blunders in my time, but I can say this, that two plants potted in the soil from the common pile were just as good as those grown in special soil. The specimen Garza shown at the last exhibition here was one of these.

When I first set out to pile up potting soil I scratched hard for turf. I landed in New Jersey, and those who have lived in the manufacturing districts about New York know how scarce a bit of turf is. I was bound to have it, and so made up a pile of witch grass dug from the road-side. It was not very bad, for witch grass does not grow in poor soil. I was delighted, however, when I came to Massachusetts and the possibilities of a rare compost heap grew in my imagination, but I soon learned that turf here was not as free as water by any means. It is an old saying that "one never knows the worth of a thing until he wants to buy it." I was not to be baffled, however, and in less than a year I had half a dozen piles. I scoured the hollows in the woods for decayed leaf soil, and well remember coming across an old-time charcoal burner's camping ground in a clearing, well covered with turf. I thought I had now found just the right kind of soil for everything; but it proved to be the deadest stuff I ever used. Like a fancy dish it was no good without a dressing — a dressing of manure in this case. I made up my mind to keep my

find a secret and did until another was disappointed in the same way, and then, remembering that "misery loves company," I told how I had been deceived.

On a gentleman's place there is always a good deal of turf trimming to be done in spring time, grass edges to be neatly cut off around the walks, and borders straightened. By taking a generous slice where I dared, I usually managed to get together enough for the season's use. I am less ambitious now; if I get half a dozen cartloads of turf, I mix with it two loads of my best manure — sheep manure when I can get it. That which comes from the Colorado ranches is just right for composting, being three or four times as rich as other manures, and less is required on this account. This I put in layers alternately with pure ground bone. The bone meal and sheep manure will start fermentation, and this chemical action is valuable in more ways than one. Soil heated to 120 degrees Fahrenheit is fatal to all insect life and weed seeds, and further than this experience has shown that this chemical action is necessary to render bone meal available as a plant food. I have seen it used in a green state, but cannot say that I have been pleased with it; the odor is most disagreeable, and the mouldy condition it assumes, which is, no doubt, a necessary stage of its transition from a crude into a soluble plant food, is, to say the least, unpleasant to look upon. Bone meal is slow in becoming available, but lasting when it is; it should be worked into the compost long before it is needed, as it is not fit for use until fermentation has subsided. It should never be applied as a top dressing. Before I knew this I thought it would be a good idea to scatter a layer of bone meal on the bottom of flats I was working up for young Chrysanthemum plants. I intended they should have a good start and was, I suppose, too liberal, for in all my experience I never saw such a sickly looking lot of plants. I examined them every day and tried my best, hoping and believing they would come round. I waited almost too long. Finally I potted them in fresh soil, and when taken out of the bone meal compost I could almost have blown them over; how they managed to exist with so few roots is a mystery.

I said a light soil is best for potted plants, but this is only my experience; where a man must, perchance, get along with a heavy soil, and understands its management thoroughly, he may say as much in its favor. Two or three years ago my employer dug

out a slough; he wanted mud and also a place to dump gravel. This slough was found to be a depression in which for untold ages decayed leaves had gathered; the ground was spongy and too wet for general farming purposes. Little did we think to find black soil ten or twelve feet deep. It was piled up and valued only as swamp mud, but when it sweetened and vegetable life got a chance for possession we found that grass and whatever grew on it thrived luxuriantly, showing there was body in it. Though black in color it is light in weight and does not pack. I have grown Geraniums, Cinerarias, Chrysanthemums, Calceolarias, Cytisuses, Heaths, and Azaleas in it and all have done well. So it is; much must be gained by experience, and in no other occupation is one so much subject to his environment. All the functions of gardening go hand in hand; if we fail in one, we may fail in all. Injudicious watering of plants would lessen the value of the best compost; a lack of air and the requisite amount of heat and moisture would ruin the best plants.

To pot our plants properly is only part of the work; still "whatever is worth doing is worth doing well." Potting is like cooking a hare: "you must first catch your hare;" that is, see that you have clean pots and, if new, properly deodorized. Let me explain — gardeners know that plants seldom thrive in pots fresh from the kiln; exposure to the weathering influence of a rainstorm will sweeten them, or, lacking this, a good plan is to fill the new pots with moist earth and let it stay in them for a day or two; this earth should not be used. Next in importance to sweet, clean pots is good drainage. Crocks of broken pots are the best material to use. In healthy plants the bulk of the roots will be found among the drainage. Coal ashes are excellent for many plants, but they contain lime, and while this is a necessary ingredient in the food of some plants, it is not needed for all, and to some it is decidedly objectionable.

Plants which do the greater part of their growing during winter time, as well as those which remain a long time without repotting, require the greatest care. All potting should be done firmly and this for the most part can be done by the hand; it is seldom necessary to use the potting stick in order to pack the soil more firmly, and then only for large plants and such as have solid balls of earth, as Azaleas, Heaths, and other shrubby greenhouse plants of slow growth. I remember once hearing a story

of a youth fresh from school, about to begin his apprenticeship in a large place on the other side. He came into the potting shed, whittling a stick; on being asked what he was going to do with that, he replied he was going to pot orchids with it.

Plants which grow quickly, such as Geraniums, Heliotropes, Coleuses, Fuchsias, and what gardeners include under the general term of "soft-wooded plants," require less care; in fact, as spring advances and time becomes precious, quickly growing stock is potted with very little ceremony. A quick hand will pot several thousands of small plants in a day.

A common practice among amateurs is to put out their window plants for a summer's growth. It is often a surprise and also a pleasure to watch such plants make luxuriant growth in their natural elements — free and unrestricted root area with plenty of air and sunshine. Usually their growth is altogether out of proportion to the space they must occupy for the winter, and it seems as if they would require much larger pots. If, however, as is generally the case, the greater number are of the Zonale type of Pelargonium, or what we know as Geraniums, they will bear considerable hard treatment and may be roughly pruned in and much curtailed in amount of root room, and very likely will do as well as if more liberally treated. The same applies to almost all window plants. The disposition is to be far too generous with pot room. The conditions under which window plants must exist in living rooms are anything but congenial. I should prefer to dispense with my old stock after the summer's growth, having raised a lot of young stock in the meantime. The disposition to be generous is natural. It has always been regarded as "more blessed to give than to receive." One question the amateur is sure to ask is, "What fertilizer can I give my plants to start them up?" when all that is needed is better light and air, or more or less heat as the case may be. Artificial manures, no matter how attractively labelled, are sure to do more harm than good to window plants in winter time. If the plants are sick it will be owing to some other cause, and manures would only make them worse; it would be like trying to cure a dyspeptic with a course of high living.

A word or two on the use of artificial manures in the liquid form for potted plants may not be out of place here. It is intended by their use to increase growth and general productive-

ness whether it be fruits or flowers. More skill is required to continue a crop of flowers or fruits in productiveness after it has exhausted the natural resources of the soil than in bringing it to this condition; this is the mark of success with some men. It is not my intention here to name one manure above another; there are a dozen good ones, only some are safer to use than others. One of the simplest and best is the dregs from the barnyard. They contain in a highly concentrated form nearly all the constituents of a complete plant food; but even this cannot be used unstintingly. Some experience and good judgment will be required to gauge properly the amount which may be safely used in proportion to clear water. It is well to start with a one-eighth strength and increase it as experience dictates. I have used dry Colorado sheep manure, at the rate of a peck to fifty gallons, and this is right to use without fining down. Sulphate of ammonia or nitrate of soda may be used at the rate of one pound to fifty gallons of water; these are really stimulants and not lasting manures. Their action is quick both of benefit as well as injury, and an overdose is a terrible trial for one to experience. These should only be used as alternatives. Some of us have used Albert's Horticultural Manure, which is an excellent article in the hands of a cautious person, but an overdose is awful. I am not skilled in mixing manures; but am satisfied to use one at a time. Liquid manures should be used only on plants making healthy growth, and the drainage must always be free. It is very seldom that sick plants will be benefited.

The sowing of seed, when the quantities are small and often precious, requires some special mention. Here again few gardeners are in accord. In giving my own methods I know I am likely to run counter to many experienced practitioners. Mr. Jackson Dawson, of the Arnold Arboretum, and an old fellow at the Harvard Botanic Garden, whose name I regret I never knew, could give many of us points on sowing seeds and raising seedlings; still some general rules may here be given.

Sixty degrees Fahrenheit is a good temperature in which to germinate seeds of tender plants coming from semi-tropical regions. Tropical plants require somewhere in the neighborhood of eighty degrees, while seeds of many hardy plants germinate well enough at sixty, but for some even this will be too high, especially for many kinds of clematis and all such as take a long

time to germinate; some will germinate in a temperature scarcely above freezing. A light sandy loam with some leaf soil, charcoal, and brick dust sifted together will suit all seeds. Boxes or pans may be used with crocks over the holes and coarse siftings laid above this and the boxes filled with the prepared soil to within half an inch of the top and pressed firmly, then mark out drills with the edge of a label or bit of wood and scatter the seeds along; vary the depth of the drill according to the size of the seeds. Very fine seeds need no drill and may be scattered upon the surface. A shaking will generally cover the seeds enough, and the surface should again be pressed firmly with a brick or something which will leave a smooth surface. With the exception of very coarse seed, I do not practise overhead watering, preferring the sub-irrigation plan of immersing the boxes or pans to the edge, letting the water in from below. Less frequent wetting will be required and most seedlings will be up before a second application is necessary. There are several ways of disposing of the seed pans until germination takes place. I usually put over them a piece of glass and a light shading of paper; but where space is limited I have set them away in tiers, so that the bottoms do not actually rest upon the tops of those below them, and find they do almost as well as when spread over more space. As fast as germination proceeds I expose the young plants to light and air. At this stage they require very careful watering, or the whole lot will damp off in a single night. Seedlings should be transplanted as soon as large enough to be handled conveniently.

In what I have said it has not been my intention to lay down any strict rules in regard to the use of soils and potting. I should be travelling on altogether too dangerous ground. I have preferred rather to deal with some general principles on which these operations are based.

Discussion.

The lecture was illustrated by examples in potting plants, rapid potting being shown by three Ageratums, while careful potting was illustrated by the Begonia.

The lecturer said that seedsmen should always state in their catalogues, especially with regard to new plants, whether they are from tropical, temperate, or cold regions.

A lady asked how to repot a Rubber Plant. Mr. Hatfield said that the example given would be just right; he would not cut off any roots, but he would like to see the plant first.

Thomas Harrison asked what the method of preparing bone meal was.

Mr. Hatfield replied, "Take half a dozen cart-loads of turf and three hundred pounds of bone meal. The value of bone meal is increased by fermentation, which process is accompanied by heat, and often destroys insects and weed seeds." He said he would not use bone meal on Geraniums.

Mrs. E. M. Gill said she used it, and that her Geraniums did well.

A stranger asked how much sheep manure would be used with six cart-loads of turf. Mr. Hatfield considered five to six hundred pounds enough.

George D. Moore said that he used bone meal liberally on Lettuce, and it prevented "dropping." He used bone meal which was as fine as flour, and gave it to Cucumbers as well as Lettuce; in two hills left without it the vines were a foot less in growth in a short time.

W. D. Hinds asked the difference between bone meal and bone flour. Mr. Moore answered that the bone flour is so fine that it has to be put in double bags.

A gentleman asked whether old potting soil can be used a second time.

Mr. Hatfield replied that he saves old potting soil when he thinks it good enough, and uses it for annuals, such as Asters, Zinnias, Stocks, and Verbenas.

President Appleton inquired if it did not make a difference whether it is thrown over and aerated.

Mr. Hatfield said that it did. Some soil is too good to throw away, and most any can be renovated by aerating and sweetening.

A Geranium was potted to illustrate how many roots may be taken off.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 27, 1897.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered on the John Lewis Russell Foundation:

THE SPREAD OF PLANT DISEASES — A CONSIDERATION OF SOME OF THE WAYS IN WHICH PARASITIC ORGANISMS ARE DISSEMINATED.

By Dr. ERWIN F. SMITH, Assistant Pathologist, Division of Vegetable Physiology and Pathology, United States Department of Agriculture, Washington, D.C.

The subject selected for this address is a rather large one for treatment in a single lecture. Parasitic diseases of plants are disseminated in a great variety of ways. I shall not try to cover the whole field. All I desire or expect to do at this time is to call your attention in a plain, straightforward way to certain well-known facts, and to others not so well known, drawing as I proceed certain inferences or conclusions which may be of use to you hereafter in your daily work. This lecture will necessarily be rather categorical, and not of much interest, I fear, except to those who are actually growing plants as a means of livelihood. I shall for the most part neglect the common and well-known dissemination of parasites by wind and water, and deal chiefly with methods of dissemination which are to a large extent within our control. "The wind bloweth where it listeth," and we cannot stop it, but there are certain dangers we may avoid, and some of these I will endeavor to point out. I wish particularly to show how farmers, fruit growers, florists, market gardeners, and all who have to do with the growing of plants are themselves not infrequently responsible for the spread of diseases, which either destroy their crops outright or leave the balance on the wrong side of the ledger. If I can make this one fact perfectly clear to you, your own reading and reflection will do the rest, and I shall not have cast my seed into stony places or by the wayside.

As you all know, our modern intensive cultivation of flowers, fruits, and vegetables for market purposes is beset with many

difficulties. To a transient visitor who strolls about, admiring the regularity, thrift, and fruitfulness of every plant in sight, it may seem an easy matter to grow violets, roses, or chrysanthemums; tomatoes, cauliflowers, or cucumbers; strawberries, grapes, or cherries, as the case may be. Certainly nothing seems easier, and just as certainly no business of life is beset with more difficulties, requires more constant attention, more good judgment, more knowledge derived from painful experience, or more thoughtful consideration of every least detail of the business. The transient visitor sees the brilliant successes; what he does not see is the long line of mingled successes and failures, the worries and disappointments, the long experience and sleepless care of years, which have led up to this fine consummation. If he thinks such results are born full-fledged out of Mother Earth, like Minerva from the brain of Jove, and that all one has to do is to plant seeds or set out cuttings and wait contentedly for the early and the later rains, let him try for himself. It is usually easy to find some pessimistic mortal with greenhouses and trucking grounds for sale, and he can begin at once, if so inclined, let us say, on cucumbers or tomatoes for the winter and early spring market. He has himself paid fifty cents a pound for tomatoes and ten cents apiece for cucumbers, and knows there is "big money" in it. Let us follow our optimistic friend for a time and see what happens. He starts in well and early the first season. He is up with the lark and overflowing with energy. Things must gee. He has the writings of Peter Henderson by heart and all he lacks is experience. Let us drop in some months later. The plants are not doing well; the crop has practically failed. What is the matter? The seeds were poor, and did not come up, or germinated slowly and irregularly, or the seedlings damped off in great numbers, necessitating a second sowing, which set the crop back and brought the product into an overflowing market with poor prices. Or the soil was not properly selected, and yielded only inferior plants and stunted fruits, in spite of all care and coaxing. Or, possibly, the crop may have started off well, but the gardener or other help did not understand firing or the management of ventilation, the plants being nearly roasted at times, in spite of the plentiful supply of expensive thermometers hung in all parts of the house, and then suddenly chilled with floods of cold air by way of compen-

sation. Or, finally, perhaps the chief trouble was in the use of water. The management of water in hothouses is a fine art. Nothing requires better judgment and in nothing is our friend less experienced. The plants suffered at times and in particular parts of the house, let us say, from lack of water, and then were drenched by the hired man; or the unsatisfied owner, seeing that things were going wrong, took the watering out of the hands of the foreman and daily flooded the house himself according to ideas evolved out of his own inner consciousness. About this time slugs, scale insects, red spider, plant lice, nematodes, and a variety of fungous diseases made their appearance in alarming proportions, and some man of my profession was sent for. Of course, he found a most interesting set of conditions, — interesting, I mean, to the pathologist, — and, possibly, was able to afford the disheartened grower the cold comfort of some good advice about what not to do next time. This is an extreme case, and yet there are plenty of such cases every year around every great city, and the troubles and failures are not all confined to beginners or to plants grown in hothouses. If the tyros were the only sufferers, we might be content to let them alone, trusting to the hard doctrine of the survival of the fittest as the all-sufficient remedy. This, however, is not the case, even old growers sometimes experiencing great losses which might have been avoided. There are now so many people engaged in growing things for market, and competition on most crops is so very close and the profits so small, that even the most experienced and successful grower must stop every leak in his expense account, and take advantage of every least chance for increasing the quantity, quality, earliness, etc., of his crops. This he can do only by a thorough understanding of all the conditions necessary for successful growth, the avoidance of parasitic diseases being one very important consideration. It is just here that plant physiologists and pathologists, while themselves learning much from the practical grower, may nevertheless be able to render him very material assistance. As such an individual, I have been invited to address you.

If, however, you expect me to tell you today how parasitic diseases may always be avoided, you are expecting the impossible and will be disappointed. The most I can do is to tell you how some of them may be prevented, and put you on your guard as to

the doing or not doing of certain things. Along with what I shall say today, I would have you remember that plant pathology is a very new science, of which as yet we barely know the rudiments.

Every year, however, adds to the sum of our exact knowledge, and it will not be long before those growers who learn and apply this new knowledge will outstrip their fellows, and have the field to themselves. Competition is not likely to decrease, nor are prices likely to advance very much, and the profits must come from avoiding losses.

It is particularly to this enterprising class of men that I should like to speak concerning the restriction of plant diseases. In this art, as in that of modern medicine, an ounce of prevention is worth many pounds of cure. There are at least three classes of growers: First, those who never learn anything except by bitter personal experience. To such men, and I may be speaking to some of this type today, much of this address may seem theoretical and impracticable. The loss of one or two crops in succession by the attack of some preventable parasite usually affords such a man the needed personal stimulus, and thereafter, as far as my own experience with such men goes, he is a faithful convert. There is a second class of growers who believe it all, know it all, and can give pointers to any expert, but are what might be called eleventh-hour men. Whether from inertia, love of ease, or inability to plan, they never get around to try any preventive until the mischief is done. Such men are the worst to deal with, since they are pretty certain to apply some remedy when it is too late, and equally certain to declare afterwards that all such remedies are worthless, as they know from "personal experience," having tried them. There is a third class of growers who are very quick to see and equally quick to apply anything likely to add to their pecuniary profit. Probably no country in the world has more men of this type than our own. They are the men whose hard common sense will try what stuff the specialist's fine-spun theories are made of, and woe to him if he is a quack, for they will surely find him out! It is this class of men whom I most fear, and at the same time most desire to reach.

I may take for granted that all of you already know that diseases which prevail extensively, and are known as contagious or "catching" diseases, are due to parasites. This is true not

only of human and animal diseases, but also of plant diseases. The plant world has its own consumption and leprosy, its cholera and black plague, its typhoid and malaria, its grippe, diphtheria, anthrax, and glanders — diseases due to other organisms and totally different, of course, in their symptoms from those I have named, but no less widespread and destructive in their course, and no less amenable to hygienic measures, than the terrible human and animal scourges with which we are all more or less familiar.

These plant parasites are plants or animals which have in some way lodged on or gained an entrance into the plant, or "host plant," as we usually designate it, and which there multiply to its detriment. Many of these organisms are exceedingly small, so as to be readily overlooked, and all of them are well provided with means of reproduction. In case of the parasitic fungi the reproductive bodies developed on a single host plant often amount to hundreds of thousands, and in case of bacteria even to hundreds of millions. These bodies are, of course, very small, requiring good microscopes and other facilities for their study, but if the conditions are favorable a single one of them may be all that is necessary to start disease in a healthy plant.

Why, then, are not all our plants destroyed outright? This leads to another question, viz., what constitutes a parasite? In a crude way, and for the sake of convenience, we often divide the lower organisms into two classes — saprophytes and parasites; the former obtaining their nourishment from dead and decaying substances, the latter nourished at the expense of other living organisms. There are, however, all grades of saprophytism and of parasitism. Any saprophyte may become a parasite if it can gain an entrance into the plant, and can there find conditions adapted to its growth. There is a constant struggle for existence in all animate nature, and one organism or another prospers according to environmental conditions. Sometimes the advantage is wholly with the host plant, at other times largely with the parasite. Many saprophytes become only slowly adapted to parasitic ways of living. Many parasites are very sensitive to light, to heat, to dry air, and perish in a short time if exposed to these conditions. Many parasites will thrive only under unusual conditions of heat and moisture. Many of the higher plants have devised special means for their own protection, such as the physical obstacle of a thick and hard covering not easily penetrated, a waxy covering

not easily wetted, a smooth covering from which the water runs off quickly; or have interposed chemical obstacles, such as a sap not adapted to the growth of the parasite. These then are some of the reasons why all of our plants are not immediately attacked and destroyed. To sum up or restate the case: First, the parasite is very liable to be destroyed by adverse conditions before it reaches the plant. Second, it must gain an entrance into the plant by its own exertions or by the help of other organisms, and this may be difficult or impossible. Third, once in, its growth may be effectually stopped by insuperable chemical or physical obstacles. Not every potential parasite becomes an actual parasite. The difficulties lying in the way are often too great for the organism to overcome and consequently a good portion of our crops escape. The business of the pathologist is to find out just what these difficulties are in case of each particular parasite and to teach the grower how he may increase them.

The most of this address will be devoted to showing just how certain parasites succeed in getting from one plant to another. It is commonly assumed, I know, that their reproductive bodies float through the air and accidentally lodge on the plants, but while not denying that this often occurs, and is perhaps in many cases the exclusive means of infection, I am certain that in some cases this rarely or never occurs, and I am inclined to believe, for reasons which I will now explain, that in quite a large number of diseases the chief danger of infection lies in other directions. I shall occasionally refer to preventive measures, but with the facts before you, you will in many cases be able to draw your own conclusions as to the best method of procedure.

The first subject to which I invite your attention is the spread of parasite organisms by means of insects.

Spread by Insects.— This is a method of distribution which has received little attention from the cultivator, but one which I am persuaded is very common. The gnawings, borings, and punctures of insects, injurious as these often are, can by no means be reckoned as the whole of the injury which they do, and sometimes they are the least part of it. As carriers of disease they are no less potent in the vegetable than in the animal world. In what I have to say under this head I shall deal only with three diseases, but these are widespread, and their dissemination by insects has been fairly well worked out:

Pear Blight. — I will not undertake to say who first ascribed the spread of this disease to insects, but the honor of clearly proving it to be so disseminated belongs to Mr. Merton B. Waite. He it was who first isolated the pear blight germ from the mouth part of bees which had visited blighting pear flowers; who saw bees pass from such flowers to healthy ones and the blight subsequently appear in the latter; and who afterwards showed conclusively on a large scale that pear flowers covered by mosquito netting always remained free from blight, while the unprotected, insect-visited ones blighted freely. There is not only no doubt that pear blight is spread through the agency of insect visits, but so far as he has been able to determine, it is never disseminated in any other way. The organism exudes from the tree in the form of small sticky or gummy masses which are not likely to be blown about by the wind, and is easily destroyed by drying. The disease occasionally winters over in the tree, and so far as Mr. Waite has been able to determine all the spring outbreaks of pear blight start from these hold-over cases, as a result of insect visits, and not from the soil. Indeed, we have as yet no evidence that pear blight lives over in the soil.

Bacterial Wilt of Cucumbers, Muskmelons, Pumpkins, and Squashes. — This is a common disease in the northern United States, and often does great injury. It is due to a very sticky, white micro-organism which fills the water ducts, and thus brings about a sudden collapse of the plant. I have experimented with it extensively since 1893, and find it to be readily communicated by the striped cucumber beetle and sometimes also by squash bugs. Wilting vines are very full of virulent, sticky germs, ready to be carried away on the beak or jaws of the first visiting insect and deposited on the surface or in the interior of the next plant that is bitten. On one occasion I examined nearly a thousand freshly blighted leaves, and found small gnawed places inside of the blighted area of every one, and in such relation thereto that the wilt appeared to have proceeded outward from the bitten places. Subsequently I produced the disease by allowing striped beetles and squash bugs to feed on diseased leaves and then on healthy plants. My greenhouse inoculation experiments with this bacillus now exceed four hundred, but I have never had the disease escape from inoculated plants to controls, and I believe that in the field it is spread almost wholly, if not exclusively, by insects. In

what form or in what place it passes the winter, I do not yet know, but given one affected plant in a squash or cucumber field in June or July, and plenty of beetles to feed on it, and in a month or six weeks there will frequently be more diseased than healthy plants. That all are not destroyed by it appears to be due largely, if not wholly, to the fact that it is readily killed by exposure to sunlight and to dry air.

Bacterial Brown Rot of the Potato, Tomato, and Egg-Plant. — The Department of Agriculture has recently published a bulletin on this disease, which some of you may have seen. This disease is also disseminated by insects, and in all probability owes the greater part of its destructiveness to this fact. The insects feed on diseased plants that are swarming with the parasite and then crawl or fly to other plants, which are bitten and subsequently become diseased. I do not yet know how widespread this disease may be, but am now inclined to attribute to it a large part of the potato rot of the eastern United States. It may be known by the sudden wilt of the foliage, the stems becoming brown internally and shrivelling. The bacillus passes down the interior of the stem into the tubers, and brown-rots them from within. I succeeded in communicating this disease from sick to healthy plants very readily by means of Colorado potato beetles. They were taken from healthy potato fields which remained healthy, were allowed to feed on diseased leaves and stems for a few hours and then transferred to healthy plants, which they gnawed a little in various places, but from which the beetles were removed before they had done any serious injury of that sort. Seven to nine days later the plants suddenly developed the disease on many parts of the top, corresponding to many bites, and the progress of the disease after the first day or two was rapid. As the spread of this disease is simply a matter of the transfer of a few germs from the interior of diseased to the interior of healthy plants, I do not see why any gnawing or puncturing insect might not serve just as well as the potato beetle as a carrier of this disease.[1]

Spread by Snails and Slugs. — The rôle of mollusks in the dissemination of fungous and bacterial diseases is also an impor-

[1] As this paper goes through the press (Feb., 1898), Dr. W. C. Sturgis, of the Connecticut Agricultural Experiment Station, reports the interesting discovery that the mildew of Lima beans (*Phytophthora Phaseoli*, Thaxter) is disseminated by bees which visit the flowers for nectar.

tant one. The subject is new even to scientific men, and most cultivators know nothing about it. Nevertheless, the indirect damage done by these animals as carriers of disease germs is often immensely greater than the immediate and visible injuries they induce by feeding. Again I shall refer only to a few cases, but these I consider to be well-established ones.

Wagner's Experiment with Snails. — Last year a German by the name of G. Wagner published an interesting paper on the spread of fungi by snails. He experimented with downy and powdery mildews, ascomycetous fungi, and rust fungi. Snails of various sorts were transferred from diseased to healthy plants, and the disease appeared on the latter; they were fed various parasitic fungi, and a subsequent examination of the excreta showed that the spores of these fungi passed through the animals uninjured, and in condition to germinate. Finally, the dung of these snails was dissolved in water and painted on the leaves or stems of host plants and the disease followed.

In this way, three downy mildews, two powdery mildews, one Nectria, and one rust fungus were transferred to healthy plants of various sorts. Mr. Wagner thinks that fungi are very commonly distributed by snails.

Galbraith's Experiments.— Mr. Galbraith, an Englishman living in the Seychelles islands, has recently obtained equally interesting results with snails, which he finds to be largely responsible for the spread of a vanilla disease prevalent in those islands.

The Bacterial Brown Rot of Cabbage. — This disease is prevalent in many parts of the United States, and is tolerably well known to market gardeners. It blackens the veins of the leaves and the woody ring in the stem, causes the leaves to fall off, and prevents the formation of heads, or spoils those which have already formed. It is due to a micro-organism, and is disseminated in various ways. I have myself the present winter obtained striking infections by means of the common greenhouse slug. These animals were fed on diseased cabbage leaves and then transferred for a few hours to healthy cabbage plants, the disease appearing a week or two later. Insects are probably also carriers of this disease.[1]

I will next invite your attention to the danger of spread of parasitic diseases by way of the manure pile.

[1] Since this was written I have obtained conclusive evidence, using the "Southern cabbage worm" (larvæ of *Plusia brassicæ*), and have been able to confirm these green-house experiments by many observations in the field.

Spread through the Manure Pile. — Barnyard manure always contains a great variety of organisms, most of which are harmless to plants. Occasionally, however, some parasite gets into the manure heap, finds a congenial place for extended growth, and is finally hauled out by the unsuspecting cultivator and put just where it can do him the most damage. Sometimes the spores of these parasites get in through the fodder or bedding, but they are also probably occasionally introduced along with mouldy or rotting vegetables which have been thoughtlessly thrown into the barn yard or on to the manure pile. One of the most striking cases that has come under my own observation is worth describing somewhat in detail.

The Watermelon Wilt. — This disease of the watermelon is due to a fungus (*Fusarium niveum*) which enters the plant through the soil and fills up its water-conducting system, causing sudden wilt and subsequent death. It prevails extensively from South Carolina to Texas, and is by far the worst trouble melon growers have to contend with. The fungus lives over winter in the dead stems, and grows readily in manure. In 1894 I was sent to South Carolina to investigate this disease, at the urgent request of a planter who had lost nearly his whole crop. Nothing was then known as to the cause of the disease, and the conclusions I shall here give you are based on studies of the disease which have since been made in the laboratory and field. The man of whom I speak had planted seventy acres, and nearly the whole crop was affected by this disease, just that part of the field being most severely attacked that had been most carefully manured. He had formerly been a very successful melon grower, but had suffered some from this disease the preceding year. In order to have an extra fine crop, by way of compensation for losses of the previous year, he had raked and scraped every bit of litter he could procure from the whole farm, and made a large compost heap in his barnyard. Into this heap went also the refuse of a thirty-five acre melon field of the preceding year. This consisted principally of hay cut from the field in the fall, and including many dry melon vines full of the fungus, which only needed the moisture and food supply of the dung heap to grow again luxuriantly. In the spring, when he had unwittingly made an immense culture bed of his barnyard, he hauled out this infected manure and put it under his melon hills, with most disastrous results. I

have since obtained confirmatory results in other places, and am very certain that this disease was in that instance spread by way of the manure pile. Probably it is often disseminated in this manner. I shall have more to say of this interesting disease under another head.

Smut Diseases. — Some of the smut diseases are also well known to be transmissible through dung, especially in fresh manure, and for this reason the latter should never be used on fields of cereals.

Other Diseases. — While not conclusive, the evidence is strong that many diseases come out of the dung pile. I recall a bad outbreak of the so-called timber rot of cucumbers in a hothouse near Washington where it seemed almost certain that the fungus was introduced with the manure. And within the last six months three cases have come to my knowledge where serious diseases followed unusually heavy applications of manure. One of those was a sclerotium disease of ginseng in Pennsylvania, another the bacterial brown rot of turnips in Maryland, and the third a rot of celery in Florida.

This subject is at least worthy of much more careful attention than it has hitherto received, and would undoubtedly amply repay all the time put upon it. Manure should at least be kept free from the rubbish of plants that have been attacked by parasitic diseases and ought to be thoroughly composted and rotted before it is used.

Spread by Way of the Soil. — Certain parasitic diseases of plants are peculiarly soil troubles. Their home is the earth. They live and multiply in the soil indefinitely as saprophytes, and yet are always ready to become parasites when there is an opportunity. Not enough attention has been paid to this class of diseases. Among these soil fungi are some of the worst enemies the cultivator has to contend with. They are hidden out of sight, are very difficult to combat by fungicidal treatment, and when a field is once well seeded down to one of them it is practically worthless for the growing of such crops as are subject to the disease, the only satisfactory management of the land in most cases being a long rotation with crops not subject to the attacks of the parasite. These soil fungi manage to get about from field to field in various ways. Some of them are known to have been distributed in irrigation water or to have been washed

from higher to lower fields by floods; some have been carried by the plow or other tools, or on the feet of animals. Occasionally man himself digs them up and transports them into hotbeds, greenhouses, and fields. One year all of our potting soil at the Department was so badly infested with the damp-off fungus that plants could be gotten past the seedling stage only with great difficulty. Frequently these fungi creep through the earth for considerable distances, destroying nearly everything they meet or only certain species of plants. Others distort or corrode underground parts without destroying the plant. Onion smut, potato scab, the club-root of cruciferous plants, the fairy-ring fungus, Rolf's sclerotium disease, the cotton root rot; the *Dematophora necatrix*, destructive to the roots of grape vines, figs, and many other plants; the *Polyporus annosus; Trametes radiciperda*, especially destructive to the roots of coniferous trees; and the root fungus of New Zealand, which is said to destroy every sort of plant in its way, are examples of these soil parasites. I shall mention particularly only one type of these troubles, viz.:

The Fusarium Diseases of the United States. — It has fallen to my lot to study some of these parasites quite carefully, and I now know eight important cultivated plants subject to them, viz., cotton, cow-pea, watermelon, cabbage, potato, tomato, sweet potato, and pineapple. Whether we have here to deal with eight parasites or with only one widely distributed polymorphic organism remains to be determined. I am inclined to think, however, from my own numerous experiments, covering a series of years and not yet completed, that we have to do with closely related but distinct forms. All of these host plants are seriously injured and some of them over wide areas. In all of them the trouble is due to a sort of embolism or parasitic clogging of the water ducts of the plant. I have already alluded to the watermelon wilt when speaking of parasites disseminated in barnyard manure, and will here devote most of my remarks to that disease. It occurs from the Carolinas to Texas, and has practically put an end to profitable melon culture in parts of South Carolina, Georgia, Florida, and Texas. The plants are attacked in all stages from seedlings to mature vines in fruit. The first sign is a sudden wilting of the whole or a part of the vine without apparent cause. The fungus enters the plant from the soil and almost always destroys it. I have seen large fields entirely

ruined by it, and know of fertile tracts miles in extent where melon culture has been abandoned. When the soil is once infested it is worthless for melon growing for a long time — five to seven years, according to South Georgia growers who have had much experience with it.

A successful Sea Island cotton grower writes that he has abandoned fifteen acres of his best cotton land on account of this blight. A New York cabbage grower informs me that his best soil, which formerly yielded abundant crops, is now worthless for cabbage growing, and I know from a careful examination that his sole trouble arises from the fact that his soil is infested with a parasitic Fusarium. Undoubtedly these troubles have arisen, or at least have become intensified, by too frequent growing of the same crop, and the best remedy is to be found in a wide rotation. At present I know of no other.

Spread by Way of Seeds, Seedlings, Buds, Tubers, Cuttings, and Nursery Stock. — One of the best examples of a disease disseminated on seeds is the loose smut of oats and wheat. The smut spores simply adhere to the sound kernels, germinate at the same time as the kernels, and bore into the young seedlings, to remain hidden till the plants blossom. The parasite of beet burn finds its way to the young seedlings in much the same way, being carried to the beet fields along with the seed. Potato scab is spread in much the same way, *i.e.*, from the mother tuber to the progeny, but this parasite also lives over in the soil. A bad lettuce Septoria, which sometimes causes much trouble, appears to be carried over from year to year, and spread from place to place in the seed.

Many diseases are distributed in seedlings, bulbs, buds, and cuttings, and too much care cannot be exercised in their selection. Among these may be mentioned the Easter lily disease, the yellow disease of hyacinths, certain violet diseases, the California vine disease, peach yellows, peach rosette, peach mildew, and peach curl.[1]

But perhaps the most wholesale manner of distribution is through the medium of irresponsible nurserymen. In this way all sorts of fungi and insect pests are spread from one end of the

[1] Since this was written I have found that the bacterial brown rot or black rot of the cabbage is often transplanted to healthy fields from the seed bed along with the young plants. (See "Farmers' Bulletin," No. 68, U.S. Department of Agriculture, for a full account of this discovery.)

country to the other. Many examples might be adduced. The most notorious recent one in this country is the wholesale distribution of the pestiferous San José scale in the eastern United States by two New Jersey nursery men. More than this, some dealers appear to be still sending out infested trees in spite of claims to the contrary. There is no good reason why all of this nursery stock should not be fumigated in a dormant condition. If done properly the scales would be destroyed without injury to the plants. The only safety for growers appears to be in demanding this, and in refusing to accept any trees or other plants which are not clean. The damage to an orchard which is certain to result from the introduction of a single tree infested with the San José scale is so great that it becomes every fruit grower to be on his guard. The white scale or West Indian scale of the peach is also very destructive and should be guarded against with great care. If by any accident it should be as widely distributed from nurseries as the San José scale has been, it would injure the peach orchards to quite as great an extent, a few years sufficing to destroy the most robust trees. I have sometimes called it the "whitewash scale" because at a little distance affected trees look as if covered with lime.

General Conclusions respecting Preventive Measures.

1. *Prompt Removal and Destruction of Diseased Material.* — There are special reasons for this, owing (*a*) to ability of many parasites to grow and fructify on the plants, or parts of plants, which they have already destroyed, *i.e.*, to live as pure saprophytes, and (*b*) to the persistent vitality of many other sorts under what would seem to be very unfavorable conditions, *e.g.*, after being dry for months. The fusarium of watermelon grew from a dried-out laboratory culture after two and one-half years.

Practical application in:

(1) *Field.* — Pear blight, rot of stone fruits, lemon scab, black knot of plum and cherry, peach yellows, San José scale (when restricted to a few trees).

(2) *Greenhouse.* — Rust of chrysanthemums and carnations, spot of violets, rot of lettuce, black spot of roses, anthracnose and timber rot of cucumbers, wet rot of hyacinths, etc.

It is not enough to pick off the diseased parts. They must be disposed of properly. Loss may result from throwing diseased

leaves or plants under the benches. If this is the only method of disposal they might almost as well be left in place. It is generally best to burn them.

2. *Destruction of Insects and Mollusks.* — More practicable in some cases than in others.

(1) *Field.* — In the field we may make use of hand picking, nets, resin wash, kerosene emulsion, and traps of various sorts. No very satisfactory method of dealing with certain of these carriers of disease has yet been worked out. The discovery of cheap efficient ways of destroying these insects furnishes many interesting problems for the economic entomologist. A combination of this method and the preceding (removal of diseased material) is recommended for such diseases as the brown rot of the potato and cabbage and the bacterial wilt of cucurbits. Root aphides may sometimes be reached by tobacco dust dug into the soil. Root nematodes specially infest certain soils, and are difficult to combat.

(2) *Hothouse.* — The troubles most prevalent in hothouses are aphides, scale insects, red spiders, root nematodes, roaches, and slugs. Slugs may be handpicked at night. Roaches are easily poisoned with a mixture of phosphorus and honey. Nematodes in hothouses are seldom troublesome except when the potting soil is full of them to begin with or when the plants have been systematically overwatered, and in either case the remedy is obvious. Red spiders are often very troublesome, especially when the air of houses has been kept too dry. They are not easily destroyed by the common insecticides, snapping their legs, so to speak, at tobacco smoke and even at the deadly hydrocyanic acid gas, of which they can endure more than the plants. The best remedy is not to let the plants become infested, and the best palliative is frequent douching of the plants with a fine spray of water. Plant lice are readily held in check by fumigation with tobacco. This, however, must be managed with care, as radishes, violets, and some other plants are peculiarly sensitive, and a single careless fumigation might do more injury than a dozen generations of aphides. I have seen the following arrangement for fumigation in a large rose house in Washington, and many of you are probably already familiar with it: Long, narrow, shallow galvanized-iron pans half full of a very strong tobacco water were distributed down the aisles of the house, and into these about once a week was dropped a good-sized red-hot

rod or spike. These spikes were heated in the furnace and carried rapidly through the house in an iron basket. The house is quickly filled with tobacco steam. The manager assured me that this method was cheaper, less injurious to the plants, and more effective than the ordinary dry air method of tobacco fumigation. They were cutting thirteen hundred buds a day from this house and the thrift and beauty of the plants were remarkable.

Scale insects are not so easily killed; most of them will thrive on tobacco smoke and ordinary sprays. We have, however, found hydrocyanic acid gas very cheap and effective. It is a deadly poison, and must be used with the greatest care. In intelligent hands I am persuaded that it is the coming remedy for this class of troubles. There must, however, be considerable experimenting and testing on the part of specialists before it comes into general successful use. Not only does it quickly diffuse through the air and speedily kill those who breathe it, but it also kills the plants as well as the scales, if the dose is too strong. Furthermore, plants are sensitive to it in very different degrees, as Mr. A. F. Woods has shown, so that a dose which will not harm one plant will kill another. In any given case it must be determined in advance; first, what is the minimum dose for the scale, and, second, that this dose will not harm the plants. When these two facts have been ascertained the cubic contents of the house to be fumigated must be accurately computed, and then the proper amount of gas may be liberated after the house has been closed as tightly as possible and the roof wet down to make it still more air-tight. Details as to manufacture and liberation of the gas, method of computing air space, and proper dose for certain plants have been published recently by Mr. P. H. Dorsett, in the "Florists' Exchange," and I will not here describe them.

By use of this method I have seen one hundred thousand foliage plants (coleus, achyranthes, etc.) which were covered with orthezia and ruined for transplanting freed from every scale in twenty minutes' time at a trivial expense, and without the least injury to the plants. I have also known of the gas being used successfully in violet houses for the destruction of aphides.

(3) *Fungicidal Treatment.* — Among fungicidal treatments may be mentioned sulphur dusting, use of lime, use of mercuric chloride, hot-water treatment, and spraying with copper compounds. Diseases amenable to one or other of these treatments are

powdery mildew, club-root of crucifers, potato scab, wheat and oat smut, downy mildew of grape, black rot of grape, pear and quince leaf blight, pear and apple scab, melanose of orange, and damp-off fungi.

(4) *Indirect Methods — i.e.*, by furnishing the host plant with the best possible conditions for growth and the parasites with the poorest. To apply these measures properly requires a very considerable body of knowledge, both of the needs of the crop grown and of the life history of the parasite. Here is just where many growers fail, and this is why so many hothouses seems to have been erected as a special banqueting chamber for bugs and fungi of all sorts. The first thing that the owner of such a house needs to do is to learn the habits of the parasites and study the requirements of his plants until he can properly repress the one and cater to the other. Many houses are badly adapted to the requirements of the crops grown in them.

Some of the diseases commonly observed in houses, and due almost wholly to mismanagement, may be noted very briefly:

The powdery mildew of the rose, cucumber, etc., is brought on very largely by chill due to improper ventilation. Cucumber anthracnose and the timber rot are favored by excess of water and insufficient ventilation. Some houses are so constructed that they cannot be properly ventilated. Timber rot is found specially in damp corners, where the water remains in the angles of stems and leaves for hours together. The lettuce rots due to Botrytis and to the downy mildew are often brought on by excess of water and irregular heating. If time permitted, many other instances might be cited.

Sometimes these troubles are due to the attempt to grow too many kinds of plants in the same house. In such cases the grower generally tries to follow a medium course in the matter of heat, ventilation, and water-supply, and in doing so furnishes normal condition for none of his plants.

Certain field diseases may also be restricted by stimulating the plants to make the best possible growth, or in case of the onion smut, as Dr. Thaxter and Dr. Sturgis have shown, by growing the plants in soil free from the fungus and not setting them out into the infected earth until they are beyond the receptive stage.

Concerning care in the use of manure, in the selection of seeds and cuttings, and in the buying of trees and other plants, I need not say more than I have already done.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1897.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1898.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 3, 1897.

A duly notified Stated Meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

Benjamin M. Watson, Chairman of the Committee to procure a portrait of Ex-President Nathaniel T. Kidder, reported that the Committee had performed that duty, and asked to be discharged. The report was accepted and the Committee was discharged.

The President read a communication from J. D. W. French, Chairman of the Committee on Lectures and Publication, stating that the Committee desire suggestions as to subjects and lectures for another year; also that a book is in the hands of the Secretary where such suggestions can be inscribed, and that the Committee desire the coöperation of the members in making the lectures as far as possible instructive and entertaining.

Charles E. Richardson read his Annual Report as Treasurer for the year 1896, which was accepted, adopted, and ordered to be printed.

O. B. Hadwen announced the decease of Edward Winslow Lincoln, an Honorary Member of this Society, and for thirty-five years Secretary of the Worcester County Horticultural Society, and who had devoted his life to the advancement of Horticulture, and moved the appointment by the Chair of a committee to prepare memorial resolutions. The motion was carried, and the Chair

appointed as that Committee Mr. Hadwen, E. W. Wood, and Robert Manning.

Benjamin M. Watson announced the decease of Charles Eliot, who, he said, was a man thoroughly identified with horticultural matters from the time of his graduation from college, — few had been so thoroughly identified, — and moved the appointment of a committee to prepare a memorial of him. The motion was carried, and the Chair appointed as that Committee Mr. Watson, Ex-President Dr. Henry P. Walcott, and James H. Bowditch.

It was voted that the Committees on memorials to Messrs. Lincoln and Eliot be authorized to send the respective testimonials to the families of the deceased as soon as prepared.

Robert Manning announced the decease of Dr. Robert Hogg, of London, editor of the "Journal of Horticulture," author of the "Fruit Manual," and one of the leading horticulturists of Great Britain, and a Corresponding Member of this Society. It was voted that the President and Secretary write a letter to the family of Dr. Hogg expressing the Society's sense of the loss sustained by it in his decease.

The subject of awards of premiums and gratuities to persons not members of the Society was brought up by the President, and after discussion by M. H. Norton, Joseph H. Woodford, William C. Strong, William J. Stewart, O. B. Hadwen, and Mrs. E. M. Gill, the subject was, on motion of Mr. Hadwen, referred to the Executive Committee with full powers.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

George B. Dorr, of Boston,
Charles H. Rea, of Norwood,
Frederic J. Rea, of Norwood,
Charles Sander, of Brookline,
Thomas J. Grey, of Chelsea,
Ernest W. Bowditch, of Milton,
Mrs. Mary L. Stevens, of Cambridge.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, May 22, 1897.

A Special Meeting of the Massachusetts Horticultural Society was holden at eleven o'clock today, in accordance with the following request:

To the President of the Massachusetts Horticultural Society:

DEAR SIR: We hereby request you to call a Special Meeting of the Society, to be held on Saturday, the twenty-second day of May next, at eleven o'clock in the forenoon, to determine whether the Society will ratify an agreement lately made by the Finance Committee, subject to ratification by the Society, for the settlement of the controversies respecting the validity of the will and trusts of Francis B. Hayes, deceased; and also to consider what action the Society will take for the determination of questions which have arisen or may arise respecting the interests of the Society under said will and trusts, and the care and management of property which may come to the Society thereunder.

BOSTON, May 17, 1897.

(Signed) WALTER HUNNEWELL,
BENJ. C. CLARK,
T. O. FULLER,
NATHANIEL T. KIDDER,
CHAS. H. HALL,
CHAS. E. RICHARDSON,
JOS. H. WOODFORD,
GEO. F. PEIRCE,
A. SHUMAN,
E. J. MITTON,
CHAS. W. PARKER,
ROBERT MANNING.

In compliance with this request, agreeably to Section XII of the Constitution and By-Laws the following notice was sent by mail to every member of the Society:

MASSACHUSETTS HORTICULTURAL SOCIETY,
BOSTON, May 17, 1897.

Agreeably to the Constitution and By-Laws, at the request of twelve members of the Society the President hereby calls a

Special Meeting of the Society, to be held at Horticultural Hall, No. 101 Tremont Street, Boston, on Saturday, the twenty-second day of May, 1897, at eleven o'clock in the forenoon, to determine whether the Society will ratify an agreement lately made by the Finance Committee, subject to ratification by the Society, for the settlement of the controversies respecting the will and trusts of Francis B. Hayes, deceased; and also to consider what action the Society will take for the determination of questions which shall have arisen or may arise respecting the interests of the Society under said will and trusts, and the care and management of property which may come to the Society thereunder.

(Signed) FRANCIS H. APPLETON,
President Massachusetts Horticultural Society.

ROBERT MANNING,
Secretary.

At this meeting the President, FRANCIS H. APPLETON, was in the chair. The call for the meeting was read by the Secretary. It was voted to dispense with the reading of the records of the last meeting.

The President appointed the following named members as the Committee on School Gardens and Children's Herbariums for the year 1897:

Henry L. Clapp, *Chairman.*

Mrs. H. L. T. Wolcott,	Mrs. P. D. Richards,
George E. Davenport,	William P. Rich,
Miss Katharine W. Huston,	W. E. C. Rich, *Secretary.*

The President stated that Joseph B. Warner, Esq., who had been employed by the Finance Committee as counsel for the Society in the Hayes will case, was present, and it was voted to hear Mr. Warner in regard to that matter.

Mr. Warner submitted to the meeting an agreement dated May 14, 1897, made by the Finance Committee, on behalf of the Society, with Nino K. Hayes, William Minot, guardian of Harold Hayes, and Augustus P. Loring, and approved by the Attorney-General of the Commonwealth, providing for the settlement of certain questions respecting the will of Francis B. Hayes, deceased. Subsequently it was moved by Ex-President William C. Strong, and seconded by Benjamin P. Ware, that the following vote be passed:

Voted, That the agreement which has been submitted to this meeting, dated May 14, 1897, and made by the Finance Committee, on behalf of this Society, with Nino K. Hayes, William Minot, guardian of Harold Hayes, and Augustus P. Loring, and approved by the Attorney-General of the Commonwealth, providing for the settlement of certain questions respecting the will and trusts of Francis B. Hayes, deceased, is hereby ratified, and the Finance Committee, or a majority of its members as it may be at any time constituted, are hereby authorized to do all acts, execute all papers and instruments on behalf of the Society, and make all payments which may be necessary or proper, in their judgment, to confirm said agreement and carry out its terms.

This vote was unanimously passed.

It was then moved by Ex-President William H. Spooner, and seconded by Mr. Ware, that the following vote be passed:

Voted, That the whole matter of the interests of this Society under the will or trusts of Francis B. Hayes, deceased, is hereby referred to the Finance Committee, with full power to that Committee, or a majority of its members as it may at any time be constituted, to determine, in their discretion, or by proceedings at law or equity, or by compromise, or in any way which may seem to them wise, all questions which have arisen or may arise in any way concerning the rights and interests of the Society under said will or trusts, or concerning the care, management, valuation, or disposition of the property covered by said will or trusts; and generally with full power to act in all respects for this Society in all matters concerning its interests under said will and trusts; and with full power also to invest any money which may come to the Society from said will or trusts until further action shall be taken by the Society concerning the same.

This vote also was unanimously passed.

Augustus Parker moved that a vote be passed thanking the Executive and Finance Committees and Mr. Warner, the counsel employed, for their able and discreet management of the interest of the Society in the Francis B. Hayes will case.

The vote was unanimously passed.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 3, 1897.

A duly notified Stated Meeting of the Society was holden today at eleven o'clock. In the absence of the President and all the Vice-Presidents, the meeting was called to order by the Secretary, and Ex-President WILLIAM H. SPOONER was elected Chairman *pro tem.*

The Chairman read a letter from John G. Barker, Chairman of the Committee on Gardens, resigning his membership of that Committee, on account of necessary absence from Boston, and thanking the Society most heartily for the honor conferred on him in electing him for many successive years to important positions on the Flower and Garden Committees. The resignation was accepted, and Patrick Norton was nominated from the floor to fill the vacancy, and elected.

The Chairman presented a report from the Executive Committee, to whom was referred at the April meeting the subject of awards to persons not members of the Society, recommending that the subject be laid on the table. The report was accepted and adopted.

O. B. Hadwen, Chairman of the Committee to prepare a memorial of the late Edward Winslow Lincoln, of Worcester, an Honorary Member of this Society, presented the following report:

MEMORIAL OF EDWARD WINSLOW LINCOLN.

In the death of Edward Winslow Lincoln, of Worcester, this Society has lost an Honorary Member distinguished for his services to Horticulture during the last thirty-five years. Endowed with a natural as well as a highly cultivated taste, improved by his long term of service as Chairman of the Parks Commission of the City of Worcester and Secretary of the Worcester County Horticultural Society, his annual reports of each have abundantly manifested his strong love of assisting Nature, in gardens, parks, and landscapes. The influence of his life work has stimulated the adornment of horticulture in public and private places, and the landscape situated within the scope of his influence is graced with additional charms which he loved to encourage.

The science, the practice, and the literature of Horticulture have

been vastly promoted by the productions of his accomplished pen, and horticultural interests have gained in solid development by his untiring labors. His life work remains an enduring monument to perpetuate his memory.

Herewith we desire briefly to place upon the record of this Society our deep sense of the loss which horticulture has sustained by his death.

O. B. Hadwen,
E. W. Wood,
Robert Manning, } *Committee.*

The report was unanimously accepted and adopted.

Benjamin M. Watson, Chairman of the Committee to prepare a memorial of Charles Eliot, presented the following report:

The Massachusetts Horticultural Society wishes to record here, through the Committee appointed for the purpose, the death of Charles Eliot, of Brookline.

It is seldom that such deep public regret is so conspicuously shown at the death of so young a man; we, as members of a Horticultural Society, have peculiar reason to mourn.

No one of the present generation has shown greater ability in matters pertaining to the art of gardening on an extensive scale than Mr. Eliot. From the time of his graduation to the time of his death all his strength and energy had been given to the improvement of public lands and private grounds.

Mr. Eliot became a member of this Society November 4, 1893.

After graduating at Harvard he took a course of one year at the Bussey Institution, spending much time in studying the trees and shrubs in the Arnold Arboretum, often coming back for this purpose after his course was finished. He soon entered the office of Frederick L. Olmsted, as a student; first, however, spending some time in Europe, familiarizing himself with foreign parks and gardens. On completing his studies with Mr. Olmsted he established himself in business in Boston, and soon obtained numerous clients.

It was at this time and later, while he was a member of the firm of Olmsted, Olmsted, & Eliot, that he became identified with those undertakings by which he will be long remembered. While a member of the Appalachian Mountain Club he was one of the

founders of the corporation known as "Trustees of Public Reservations," its Secretary and President; from this organization sprang our admirable Metropolitan Park System. Mr. Eliot was the first Landscape Architect appointed by the Commission, and he continued in their service until his death. To him, more than any other man, the community is indebted for the preservation and improvement of these large tracts of land.

He was easily the best professional writer of the day on Landscape Gardening. His style was clear, earnest, and convincing, and he allowed no minor considerations to stand in the way of what he deemed the broadest and finest treatment looked at from the future, and no man during the past few years has done so much towards crystallizing the better inspirations of our community in this direction than Charles Eliot.

Thoroughly informed by study, observation, and mature consideration, he brought also to his professional activity the influence of a trained intellect and a real personal charm.

The loss of a man who united so many admirable qualities will be long felt and sincerely remembered by his associates here.

H. P. Walcott,
B. M. Watson,
J. H. Bowditch,
} *Committee.*

Boston, 14th April, 1897.

This report, also, was unanimously accepted and adopted, and ordered to be entered on the records.

The Chairman read a letter from the Boston Society of Natural History asking the Society to join with the Society of Natural History and the several leading scientific and educational institutions in this city in an invitation to the American Association for the Advancement of Science, to celebrate the fiftieth anniversary of its organization in Boston, its birthplace, in August, 1898. This letter had been considered by the Executive Committee, who advised that this Society unite with the Society of Natural History in the invitation to the Association for the Advancement of Science. On motion of Nathaniel T. Kidder, it was voted that this Society do so unite.

On motion of William C. Strong, it was

Voted, That the President be authorized to offer the use of our Hall to the American Association for the Advancement of Science,

for the purpose of holding its meetings when in session in the City of Boston in 1898, in case this Society is in his opinion able to do so.

The Chair announced the following Committee, appointed by the President, agreeably to the Constitution and By-Laws, to nominate candidates for Officers and Standing Committees for the year 1898:

William H. Spooner, *Chairman*.

Benjamin M. Watson,	Patrick Norton,
Samuel Hartwell,	Azell C. Bowditch,
Benjamin P. Ware,	Charles F. Curtis.

The Chairman announced the receipt of a letter from Mary Yale Eliot, acknowledging the receipt of the memorial of her late husband, Charles Eliot, and expressing her high sense of its value, and also a letter from Robert Milligan Hogg, of London, of similar tenor, in reply to a letter written by the President and Secretary of this Society, agreeably to the vote of the Society at the April meeting, expressing the Society's sense of the loss sustained in the decease of its Corresponding Member, Dr. Robert Hogg.

The decease of Hon. Joseph S. Fay, an Honorary Member of the Society, was announced, and Dr. Henry P. Walcott, E. W. Bowditch, and Walter Hunnewell were appointed to prepare a memorial of him.

The decease of Robert Douglas, of Waukegan, Ill., a Corresponding Member of the Society, was announced, and Charles S. Sargent, J. W. Manning, and James H. Bowditch were appointed a Committee to prepare a memorial.

The following vote, moved by Joseph H. Woodford, was passed:

Voted, That the Secretary write to J. G. Barker, requesting him to send warrants, signed by him, to the Treasurer, for payment of services by his Committee.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

Osborn B. Hall, of Malden,
Frederick W. Damon, of Arlington,
George H. Braman, of Newton,
Wilfred Wheeler, of Concord,
Dr. Mary E. Jones, of Boston.

On recommendation of the Executive Committee,

Hon. James Wilson, Secretary of Agriculture, Washington, D.C., was elected an Honorary Member of the Society, and

J. W. Hoffman, Ph.D., Director of the Department of Agricultural Biology and Chemistry in Tuskegee Normal and Industrial Institute, Tuskegee, Alabama, was elected a Corresponding Member.

Adjourned to Saturday, September 4.

BUSINESS MEETING.

Saturday, September 4, 1897.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, Francis H. Appleton, in the chair.

William H. Spooner, Chairman of the Committee appointed at the July meeting to nominate candidates for Officers and Standing Committees for the year 1898, reported a printed list, which was accepted. It was voted that the Committee be continued, and requested to nominate candidates to fill any vacancies that might occur before election.

The following memorial of Hon. Joseph S. Fay, prepared by the Committee appointed for that purpose at the July meeting, was presented and adopted:

Hon. Joseph Story Fay, an Honorary Member of the Massachusetts Horticultural Society, died at Boston on the 14th of June, 1897.

Many years ago he began, at his seaside home at Wood's Holl, the tree plantations which made him one of our earliest and most successful leaders in the reforesting of the denuded areas of the State.

In the later years of his life he entered the lists at the exhibitions in this Hall with specimens of fruits, flowers, and vegetables which fairly earned an unusual number of our highest prizes.

Beyond these successes, however, were those personal qualities which will attach to his memory the lasting sentiments of gratitude and respect of so many persons.

An appropriate permanent memorial of him exists in the seventy acres of charming natural scenery in the town of Falmouth, given by him to the people as a continued place of recreation, and happily named by him "Goodwill Park."

The multitudes that he made partners with him in all the attractions of his beautiful garden at Wood's Holl will long remember the kindly presence of one who found the keenest enjoyments of his life in sharing his own possessions with his less fortunate neighbors.

HENRY P. WALCOTT,
WALTER HUNNEWELL, } *Committee.*

The decease of Samuel R. Payson, an Honorary Member of the Society, and that of Edwin W. Buswell, for many years Treasurer of the Society, was announced, and it was voted that the President appoint Committees to prepare memorials of these two members.

Adjourned.

BUSINESS MEETING.

SATURDAY, October 2, 1897.

A Stated Meeting of the Massachusetts Horticultural Society, being the Annual Meeting for the choice of Officers and Standing Committees, was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The Secretary stated that the meeting had been duly called agreeably to the Constitution and By-Laws.

Agreeably to the Constitution and By-Laws, the President appointed Hon. Aaron Low, James Comley, and J. W. Manning a Committee to receive, assort, and count the votes given, and report the number. The polls were opened at five minutes past eleven o'clock.

The President, as Chairman of the Executive Committee, made the following report:

At a regular meeting of the Executive Committee, held September 25, it was voted to recommend to the Society to transfer $30 of the appropriation for the Fruit Committee for 1896 to the account of the Flower Committee for the same year, to make up for a deficiency in the amount at the command of the latter.

The transfer was unanimously authorized.

The following memorial of Robert Douglas, drawn up by Charles S. Sargent, Chairman of a Committee appointed at the July meeting for that purpose, was read and unanimously adopted:

Robert Douglas was born at Gateshead, near Halifax, England, in 1813, and removed to Canada in 1836. Two years later he settled in Whitingham, Vt., where for a short time he kept the country inn, and in 1844 he made his home on the shores of Lake Michigan, about thirty miles north of Chicago, in what is now the city of Waukegan. Here, a few years later, having been interested in the cultivation of plants since he was a boy, when he lived with his parents in Fallon's Nursery, near Newcastle, he established a small nursery business and found his true occupation; and here, during the remainder of his life, he devoted himself to raising conifer and other tree seedlings, of which he has distributed millions through the country. More recently Mr. Douglas made, under contract, successful plantations of forest trees in the western prairies, and in his time no one has been more active in increasing the love of planting trees in this country, or has studied trees from a cultural point of view with greater zeal, intelligence, or success. The integrity and purity of the life of Robert Douglas, his total lack of self-seeking, and his unfailing cheerfulness commanded the respect and affection of all who knew him.

CHARLES S. SARGENT,
J. W. MANNING,
JAMES H. BOWDITCH,
} *Committee.*

The Secretary read a letter from Joseph S. Fay, Jr., acknowledging, in behalf of his family, the memorial of his father adopted at the last meeting of the Society, and thanking the Society for it.

The following vote, offered by Hon. Aaron Low, was unanimously passed:

Voted, That the several committees be required to hold official meetings to arrange a list of prizes to be presented to the Committee on Establishing Prizes to be offered by the Society.

The Committee provided for at the last meeting of the Society to prepare a memorial of the late Samuel R. Payson was announced by the President as follows: Benjamin C. Clark, William H. Spooner, and Walter Hunnewell.

And the Committee to prepare a memorial of Edwin W. Buswell as follows: E. W. Wood, Samuel Hartwell, and George E. Davenport.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

William H. Burlen, of Boston,
William J. Kennedy, of Brighton,
Marcellus A. Patten, of Tewksbury,
Edward A. Wilkie, of Newtonville,
George E. Francis, M.D., of Worcester,
Arthur F. Estabrook, of Boston,
James O. Hale, of Byfield,
William S. Briggs, of Lincoln,
Mrs. F. A. (Sarah C.) Pierce, of Brookline,
Isaac Sprague, of Wellesley Hills.

The polls were closed at five minutes past one o'clock, and the Committee to receive, assort, and count the number given reported the whole number of ballots cast to be fifty-five, and that the members named on the ticket reported by the Nominating Committee had a plurality of votes and were elected.

The report of the Committee was accepted, and the persons named on the above mentioned ticket were, agreeably to the Constitution and By-Laws, declared by the Chairman, O. B. Hadwen (the President having retired and called Mr. Hadwen to the chair) to have a plurality of votes, and to be elected Officers and Standing Committees of the Society for the year 1898.

Adjourned to Saturday, November 6.

BUSINESS MEETING.

SATURDAY, November 6, 1897.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following memorial of Samuel R. Payson was read by Benjamin C. Clark, Chairman of the Committee appointed at the meeting on Saturday, September 4, to prepare an expression of the feelings of the Society on his death:

SAMUEL R. PAYSON.

The Massachusetts Horticultural Society desires to place upon its records a deep-felt expression of its sense of loss in the decease of Mr. Samuel R. Payson, one of its oldest, most useful, and most honored members.

Mr. Payson was a many sided man, a most eminent and public spirited Boston merchant, and a true Christian gentleman. His leading characteristics were thoroughness, capacity, benevolence, and integrity. Familiar to an unusual degree with all his vast collection of fruits and plants, it was his pleasure conscientiously and generously to share with the public his enjoyment of them.

When called upon to bear heavy pecuniary losses through the fault of others, he patiently submitted, and disaster only seemed, in his case, to prove a stimulus to efforts which ultimately resulted in the full discharge of every obligation.

Faithful in the discharge of every duty, diligent in business, combining great sagacity with incorruptible integrity and an uprightness which never wavered, aiding always in promoting the aims and objects of our Society, he has gone to his rest in the fulness of years, leaving a memory which will be most cherished by those who knew him best and longest.

BENJ. C. CLARK,
WM. H. SPOONER,
WALTER HUNNEWELL, } *Committee.*

The memorial was unanimously adopted.

The President, as Chairman of the Executive Committee, reported from that Committee a recommendation that the Society appropriate the following named sums for Prizes and Gratuities

for the year 1898, the total being the same as the present year, viz.:

For Prizes and Gratuities:

For Plants	$2,000
" Flowers	2,668
" Fruits	1,732
" Vegetables	1,200
" Gardens	500
Total for Prizes and Gratuities for the year 1898	$8,100

The report was accepted, and, agreeably to the Constitution and By-Laws, was laid over until the first Saturday in January.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

Edward O. Orpet, of South Lancaster,
Edward D. Blake, of Boston,
Herbert Dumaresq, of Chestnut Hill.

Adjourned to Saturday, December 4.

BUSINESS MEETING.

Saturday, December 4, 1897.

An adjourned meeting of the Society was holden today at eleven o'clock. Neither the President nor either of the Vice-Presidents being present, the meeting was called to order by the Secretary, and Samuel Hartwell was unanimously elected Chairman *pro tem.*

E. W. Wood, Chairman of the Committee appointed at the October meeting to prepare a memorial of Edwin W. Buswell, presented the following:

Every year the Society is called to record the death of members who have been active in promoting its interests, and the present year has proved no exception.

Edwin William Buswell was born April 25, 1813, and died

August 5, 1897. He held for a number of years important offices of the Society, and discharged his duties in an efficient and acceptable manner. He was passionately fond of flowers, and previously to his connection with the Society, while engaged in mercantile pursuits, he devoted his leisure hours to their cultivation.

He was elected a member of the Society in 1856. He was elected a member of the Flower Committee from 1861 to 1866, serving two years as Chairman. In August, 1866, he was elected Treasurer of the Society, and he also discharged the duties of Librarian and Corresponding Secretary. In these positions he found a congenial field of labor. Not only members of the Society, but strangers visiting the Library seeking information, were pleasantly entertained and assisted in securing the information desired. He continued in the faithful discharge of his various duties until he tendered his resignation, June 2, 1881. He then removed to Brooklyn, N.Y., where he continued to reside until his death. He spent much of his time with his horticultural friends in the vicinity, many of whom expressed surprise at the extent and accuracy of his knowledge of the nomenclature of the plants in cultivation.

Resolved, That in the death of Mr. Buswell the Society loses one among its oldest members, who spent the best years of his life in its service.

Resolved, That this action of the Society be placed upon its records, and that a copy be sent to the family of the deceased.

E. W. Wood,
George E. Davenport,
Samuel Hartwell,
} *Committee.*

The memorial was unanimously accepted and adopted.

E. W. Wood, Chairman of the Fruit Committee, read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication.

J. Woodward Manning, from the Committee on Establishing Prizes, reported the Schedule of Prizes for 1898 prepared by the Committee, and stated the principal changes from the Schedule of the present year. The report was accepted, and the Schedule as reported was adopted as the Schedule of Prizes for 1898.

Mr. Manning also submitted the following further report:

It is the sense of the Committee on Establishing Prizes that there should be a Committee appointed annually for the purpose of awarding prizes and gratuities to exhibits of a strictly botanical character, such as Native Plants exhibits, such committee to have similar powers and to be guided by similar rules to those which now guide the Committee on School Gardens and Children's Herbariums, and to be allowed a separate appropriation.

After remarks by George E. Davenport, Robert Manning, J. H. Woodford, and J. Woodward Manning, on the importance which the work of the Committee on School Gardens, etc., has attained and the widespread interest which it has excited, and other points, the report was laid on the table.

On motion of Azell C. Bowditch, it was voted that the thanks of the Society be presented to Charles A. Read, Jr., for his kind and generous offer of Prizes for Orchard Houses, and that it be accepted.

The Librarian laid before the Society a copy of "A Traveller's Notes of a Tour through India, Malaysia, Japan, Corea, the Australian Colonies, and New Zealand during the Years 1891–1893," by James Herbert Veitch, F.L.S., F.R.H.S., printed for private circulation and presented by the author. It was voted that the thanks of the Society be presented to Mr. Veitch for this interesting and valuable addition to the Library.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

Edmund M. Wood, of Natick,
James W. Nelson, of Framingham,
Henry A. Wheeler, of Newtonville,
John Barr, of Wellesley,
George H. Morgan, of New York,
J. A. Pettigrew, of Jamaica Plain.

Adjourned to Saturday, December 18, 1897.

BUSINESS MEETING.

SATURDAY, December 18, 1897.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

On motion of Joseph H. Woodford, it was

Voted, That the Annual Reports of the several awarding committees, etc., be accepted and referred to the Committee on Publication, without reading.

The following named reports were then presented and so referred:

The Annual Report of the Committee on Plants, by Azell C. Bowditch, Chairman.

The Annual Report of the Committee on Flowers, by J. Woodward Manning, Chairman.

The Annual Report of the Committee on Vegetables, by Charles N. Brackett, Chairman.

The Annual Report of the Committee of Arrangements, by Joseph H. Woodford, Chairman.

The Annual Report of the Committee on the Library, by William E. Endicott, Chairman.

The Annual Report of the Secretary and Librarian, by Robert Manning, Secretary and Librarian.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS,

FOR THE YEAR 1897.

By AZELL C. BOWDITCH, Chairman.

The exhibitions of plants during the past season have been fully equal, and in many respects superior, to those of the preceding year. They have attracted many new exhibitors, and the specimens offered have shown a marked improvement, especially in Orchids.

Many new plants have been brought to our notice which will be mentioned farther on. The public have taken a greater interest in the exhibitions through the season, as manifested by the increased attendance, the amateur and the beginner having a fine chance to study and compare varieties and acquire knowledge not otherwise attainable.

The display of Azaleas has not been as good as your Committee could have wished, but, by doing away with the restrictions on the size of the pots, we hope in the future to get exhibits more worthy of the premiums offered. James Wheeler has entered for the Prospective Prize a fine white Azalea, named Mrs. J. H. White, of which your Committee think favorably; if on further trial it should bear out its good points, it will be quite an acquisition.

The first prize exhibition was on January 9, when John L. Gardner, Mrs. B. P. Cheney, and others showed some fine plants of an improved strain of the Chinese Primula. Your Committee hope, by removing the restrictions as to the size of pots, to have the coming season much larger and finer plants.

John L. Gardner exhibited *Primula stellata* for the first time. Your Committee think this will prove a valuable acquisition, owing to its long keeping qualities; it lasts two or three weeks after being cut. It was awarded a First Class Certificate of Merit.

January 16. Eight varieties of Cypripedium were shown by Oakes Ames. Among them was C. Susan Ames, which was awarded Honorable Mention. Mr. Ames exhibited also a fine plant of *Scuticaria Steelii*, the shoestring Orchid. C. E. Richardson brought a plant of *Senecio Petasitis*.

January 23. J. S. Bailey showed plants of the semi-double Cyclamen. Your Committee do not think this will prove to be a very valuable acquisition, the petals being not well developed, but curly, and conveying the appearance of a badly shaped flower.

January 30. We had from William Wallace Lunt a seedling Cypripedium bearing his name, a beautiful specimen. J. H. Hemingway, gardener to F. E. Simpson, brought some fine Violets.

February 6. From George McWilliam came two seedling Cymbidiums, having *eburneum* and *Lowianum* as parents, for which a First Class Certificate of Merit was awarded. He also exhibited four seedling Cypripediums. Mr. McWilliam has been a close student, and has met with marked success in hybridizing, as the above mentioned seedlings testify. Mrs. J. C. Whiton sent two baskets of *Dendrobium nobile*. J. E. Rothwell showed five varieties of Cypripediums, and John L. Gardner two plants of Sophronitis.

SPRING EXHIBITION.

March 23, 24, 25, and 26.

The Spring Exhibition tested the capacity of our halls, and certainly there has never been a finer display of bulbous plants. Among the larger contributors were the Bussey Institution, Dr. C. G. Weld, John L. Gardner, J. W. Howard, and Warren Ewell & Son. The prizes have been somewhat altered, as will be seen by referring to the Schedule for 1898.

May 15. R. & J. Farquhar exhibited a new bedding Begonia, *B. erecta compacta multiflora*, which in the opinion of your Committee will prove worthy of cultivation. J. E. Rothwell showed a fine plant of *Cypripedium bellatulum*, with ten flowers.

ROSE AND STRAWBERRY EXHIBITION.

June 22 and 23.

E. V. R. Thayer made a beautiful display of Orchids in variety, for which the first prize was awarded, W. P. Winsor taking the second. W. A. Manda, of South Orange, N. J., contributed a new hybrid Laelio-Cattleya, variety Superba, which was most remarkable for its brilliant coloring.

July 31. There came from the estate of Joseph S. Fay four very fine plants of *Hydrangea cyanoclada hortensia*, which for profusion of bloom and symmetry of plants have not been excelled.

August 21. J. E. Rothwell was awarded a Silver Medal for Cypripedium Frau Ida Brandt, the first time exhibited.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

September 1 and 2.

The Annual Exhibition of Plants again demonstrated the fact that the Society has far outgrown the capacity of our halls. The collections of Greenhouse Plants were exceedingly fine and well grown. J. S. Bailey carried off the first prize, followed by John L. Gardner, N. T. Kidder, and Dr. C. G. Weld. J. H. White had about twenty specimens of Fuchsias, for which the first prize was awarded. William Donald had a superb plant of *Alocasia Sanderiana;* he was awarded a Silver Medal for its superior cultivation.

CHRYSANTHEMUM EXHIBITION.

November 2, 3, 4, and 5.

The Plant Department of the Chrysanthemum Exhibition the past season had not as many contributors as in former years, but excelled all previous efforts in quality; the plants had a more even look, but would have been much finer could the exhibition have taken place one week later. The Committee have made some changes in the Schedule for the coming year which they hope will induce more growers to compete, and thus add to the appearance of the exhibition. Among the larger contributors, N. T. Kidder was first and Mrs. B. P. Cheney a close second, followed by J. S. Bailey and others.

J. S. Bailey also contributed a fine collection of Orchids.

December 4. F. L. Harris, gardener to H. H. Hunnewell, exhibited a fine plant of Begonia Gloire de Lorraine, for which a Silver Medal was awarded. Too much cannot be said of this beautiful plant; as a house plant it will prove a valuable acquisition, being in flower nearly all the time. Its culture will certainly well repay any one who has a love for house plants.

On this day, and also on the eleventh, Hon. C. G. Roebling, of Trenton, N.J., exhibited some fine specimens of Cypripediums, especially *C. Leeanum Clinkaberryanum*, a garden variety, which was quite distinct and beautifully marked. A Silver Medal was awarded for each of these exhibits.

Amount appropriated		$2,000 00
Awarded in Premiums and Gratuities .	$1,811 00	
Thirteen Silver Medals	65 00	
	———	1,876 00
Balance unexpended		$124 00

All of which is respectfully submitted.

A. C. Bowditch,
A. H. Fewkes,
James Comley,
William J. Martin,
Committee on Plants.

PRIZES AND GRATUITIES AWARDED FOR PLANTS.

1897.

January 9.

Chinese Primroses. — Six plants, in six-inch pots, John L. Gardner, $5 00
Second, Mrs. Benjamin P. Cheney 4 00
Third, Mrs. Benjamin P. Cheney 3 00

Gratuity : —
John L. Gardner, Display of Orchids 5 00

January 16.

Gratuity : —
Charles E. Richardson, *Senecio Petasitis* 2 00

February 6.

Freesias. — Six pots or pans, Bussey Institution 5 00

Gratuities : —
Mrs. J. C. Whiton, two baskets of Dendrobiums 3 00
James E. Rothwell, Cypripediums 1 00
John L. Gardner, Sophronitis 1 00

March 13.

Gratuity : —
James Comley, Large Azalea 5 00

SPRING EXHIBITION.

March 23, 24, 25, and 26.

Theodore Lyman Fund.

Indian Azaleas. — Four distinct named varieties in not exceeding ten-inch pots, Dr. C. G. Weld 12 00
Second, Bussey Institution 10 00
Two distinct named varieties in not exceeding ten-inch pots, Dr. C. G. Weld 6 00
Second, Bussey Institution 4 00
Specimen Plant, named, Dr. C. G. Weld 10 00
Second, Bussey Institution 8 00
Third, James Comley 5 00

Society's Prizes.

Orchids. — Three plants, John L. Gardner 10 00
Hardy Orchids. — Collection in pots or pans, forced, not less than four species, John L. Gardner 6 00
Stove or Greenhouse Plants. — Specimen in bloom other than Azalea or Orchid, Dr. C. G. Weld 8 00
Second, J. W. Howard 6 00

HARD-WOODED GREENHOUSE PLANTS. — Four, in bloom, Dr. C. G. Weld $10 00
Second, Dr. C. G. Weld 8 00
HYBRID PERPETUAL ROSES. — Forced, six plants, not less than three distinct varieties, Charles H. Souther 10 00
Second, James Comley 8 00
CLIMBING ROSE, CRIMSON RAMBLER. — Specimen plant, in bloom, Jackson Dawson 8 00
Second, Charles J. Dawson 6 00
HARDY FLOWERING DECIDUOUS SHRUBS, FORCED. — Four, of four distinct species, named, Bussey Institution 6 00
Second, Bussey Institution 4 00
HARDY FLOWERING EVERGREEN SHRUBS, FORCED. — Four, of four distinct species, named, Bussey Institution 6 00
CANNAS. — Display in pots, the second prize to James L. Little . 8 00
HARDY PRIMROSES AND POLYANTHUSES. — Twelve plants of distinct varieties, John L. Gardner 8 00
Second, John L. Gardner 6 00
Third, James L. Little 4 00
AURICULAS. — Six, in pots, Dr. C. G. Weld 6 00
CYCLAMENS. — Ten plants, Mrs. Benjamin P. Cheney 15 00
Second, Mrs. Benjamin P. Cheney 12 00
Third, Nathaniel T. Kidder 10 00
Fourth, George M. Anderson 8 00
Ten plants, in not over seven-inch pots, Mrs. Benjamin P. Cheney, 8 00
Second, Nathaniel T. Kidder 6 00
Third, Mrs. Benjamin P. Cheney 4 00
Single plant, E. S. Converse 5 00
Second, Nathaniel T. Kidder 4 00
Third, Mrs. Benjamin P. Cheney 3 00
CINERARIAS. — Six varieties, Jason S. Bailey 10 00
Second, George M. Anderson 8 00
Third, John L. Gardner 6 00
Fourth, Dr. C. G. Weld 5 00
Three varieties, Jason S. Bailey 6 00
Second, George M. Anderson 5 00
Third, E. S. Converse 4 00
Single plant, Jason S. Bailey 4 00
Second, H. H. Rogers 3 00
Third, H. H. Rogers 2 00
HYACINTHS. — Twelve distinct named varieties in pots, one in each pot, John L. Gardner 8 00
Second, Bussey Institution 6 00
Third, Dr. C. G. Weld 4 00
Six distinct named varieties in pots, one in each pot, Dr. C. G. Weld 5 00
Second, Bussey Institution 4 00
Third, E. S. Converse 3 00

Three distinct named varieties in pots, one in each pot, Dr. C. G. Weld	$3 00
Second, Bussey Institution	2 00
Third, J. W. Howard	1 00
Single named bulb, in pot, Bussey Institution	2 00
Second, John L. Gardner	1 00
Three pans not to exceed twelve inches, ten bulbs of one variety in each pan, Dr. C. G. Weld	8 00
Second, Bussey Institution	6 00
Third, John L. Gardner	4 00
Two pans not to exceed twelve inches, ten bulbs of one variety in each pan, John L. Gardner	6 00
Second, Bussey Institution	4 00
Third, Dr. C. G. Weld	3 00
Single pan not to exceed twelve inches, ten bulbs of one variety, Dr. C. G. Weld	4 00
Second, John L. Gardner	3 00
Third, Bussey Institution	2 00
Tulips. — Six eight-inch pans, nine bulbs of one variety in each, W. S. Ewell & Son	4 00
Second, Dr. C. G. Weld	3 00
Third, W. S. Ewell & Son	2 00
Three eight-inch pans, nine bulbs of one variety in each, W. S. Ewell & Son	3 00
Second, Bussey Institution	2 00
Third, Bussey Institution	1 00
Three ten-inch pans, twelve bulbs of one variety in each, Dr. C. G. Weld	5 00
Second, Dr. C. G. Weld	4 00
Third, James L. Little	3 00
Fourth, Bussey Institution	2 00
Polyanthus Narcissus. — Four seven-inch pots, five bulbs in each, distinct varieties, Dr. C. G. Weld	6 00
Second, Dr. C. G. Weld	4 00
Third, Bussey Institution	3 00
Jonquils. — Six pots or pans, not exceeding eight inches, the number of bulbs in each to be at the discretion of the grower, W. S. Ewell & Son	4 00
Second, W. S. Ewell & Son	3 00
Third, Bussey Institution	2 00
Narcissuses. — Six eight-inch pans, distinct varieties, single or double, Dr. C. G. Weld	5 00
Second, W. S. Ewell & Son	4 00
Three eight-inch pans, W. S. Ewell & Son	4 00
Second, Dr. C. G. Weld	3 00
Lilium Longiflorum. — Six pots, not exceeding ten inches, J. W. Howard	10 00

LILIUM HARRISII. — Six pots, not exceeding ten inches, Dr. C. G. Weld $10 00
Second, J. W. Howard 8 00
LILY OF THE VALLEY. — Six pots, not exceeding seven inches, Bussey Institution 4 00
Second, Bussey Institution 3 00
Third, W. S. Ewell & Son 2 00
ANEMONES. — Three pots or pans, Bussey Institution . . . 3 00
FREESIAS. — Six pots or pans, James L. Little 4 00
Second, Dr. C. G. Weld 3 00
Third, Bussey Institution 2 00
IXIAS AND TRITONIAS. — Six pots or pans in varieties, Dr. C. G. Weld 4 00
Second, Dr. C. G. Weld 3 00
ROMAN HYACINTHS. — Six eight-inch pans, ten bulbs in a pan, W. S. Ewell & Son 4 00
Second, W. S. Ewell & Son 3 00
Third, Dr. C. G. Weld 2 00
GENERAL DISPLAY OF SPRING BULBS. — All classes, Bussey Institution 15 00
Second, J. W. Howard 12 00
Third, W. S. Ewell & Son 10 00

Gratuities: —

James Comley, Display of Azaleas 5 00
Bussey Institution, " " 3 00
George M. Anderson, Display of Cyclamens 5 00
H. H. Rogers, Display of Cyclamens and Cinerarias . . . 6 00
W. S. Ewell & Son, Display of Crocuses 2 00

MAY EXHIBITION.

MAY 1.

PELARGONIUMS. — Six pots or pans of Ivy-Leaved, in bloom, the second prize to Dr. C. G. Weld 5 00
INDIAN AZALEAS. — Six plants, in pots, named, Dr. C. G. Weld . 15 00
Single specimen, Dr. C. G. Weld 5 00
Second, Dr. C. G. Weld 4 00
CALCEOLARIAS. — Six varieties in pots, Jason S. Bailey . . . 8 00
Second, Mrs Benjamin P. Cheney 7 00
Third, " " " 5 00
Fourth, " " " 4 00
Single plant, Jason S. Bailey 3 00
Second, Mrs. Benjamin P. Cheney 2 00
Third, " " " 1 00
STREPTOCARPUSES. — Twelve in not exceeding six-inch pots, Mrs. Benjamin P. Cheney 3 00
Second, Mrs. Benjamin P. Cheney 2 00

Gratuities : —

Dr. C. G. Weld, Display of Seedling Amaryllises	$5 00
Dr. C. G. Weld, Boronias and Saintpaulia	3 00
Charles H. Souther, Calceolarias	3 00

MAY 15.

Gratuities : —

Walter Hunnewell, *Hydrangea Otaksa*	2 00
Edward J. Mitton, *Saxifraga sarmentosa*	1 00

MAY 22.

Gratuity : —

James Comley, *Cattleya Gaskelliana*	1 00

RHODODENDRON SHOW.

JUNE 3 AND 4.

Gratuities : —

William Wallace Lunt, *Cattleya Reineckiana*	1 00
John L. Gardner, Display of Orchids	10 00
Nathaniel T. Kidder, Display of Pelargoniums	6 00

ROSE EXHIBITION.

JUNE 22 AND 23.

ORCHIDS. — Six plants of six named varieties in bloom, E. V. R. Thayer	25 00
Second, W. P. Winsor	15 00
Three plants, John L. Gardner	15 00
Second, W. P. Winsor	10 00
Single specimen, Kenneth Finlayson	8 00
Second, John L. Gardner	6 00
TUBEROUS BEGONIAS. — Six pots of six varieties, Edward J. Mitton,	6 00

Gratuity : —

Nathaniel T. Kidder, Bougainvillea	5 00

JUNE 26.

Gratuity : —

E. S. Converse, *Begonia erecta*	4 00

JULY 10.

Gratuity : —

Jason S. Bailey, *Cœlogyne Massangeana*	2 00

JULY 17.

Gratuity : —

Mrs. Arthur W. Blake, Hydrangeas	10 00

JULY 24.

Gratuity : —

James E. Rothwell, Display of Orchids $4 00

JULY 31.

Gratuities : —

Estate of Joseph S. Fay, Hydrangeas 20 00

Nathaniel T. Kidder, *Aërides odorata* 5 00

AUGUST 21.

OUVIRANDRA FENESTRALIS. — E. S. Converse 8 00

Second, John L. Gardner 6 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 1 AND 2.

PALMS. — Pair in pots or tubs not more than twenty-four inches in diameter, Joseph H. White 12 00

Second, John L. Gardner 8 00

Pair in pots not more than fourteen inches in diameter, Dr. C. G. Weld 8 00

Second, Joseph H. White 6 00

GREENHOUSE PLANTS. — Collection containing foliage plants of all descriptions, not to exceed forty plants, in pots or tubs, Jason S. Bailey 40 00

Second, John L. Gardner 30 00

Six Greenhouse and Stove plants of different named varieties, two Crotons admissible, Nathaniel T. Kidder 25 00

Second, Dr. C. G. Weld 20 00

Third, John L. Gardner 15 00

Single plant for table decoration, in a twelve-inch pan or basket, dressed at the base with living plants only; only one entry admissible, the second prize to E. S. Converse . . . 6 00

Third, Charles H. Souther 4 00

SPECIMEN FLOWERING GREENHOUSE PLANT. — Single named variety, Charles H. Souther 8 00

Second, James L. Little 6 00

FUCHSIAS. — Six in not over ten-inch pots, Joseph H. White . . 12 00

Second, Charles H. Souther 10 00

FLOWERING PLANTS. — Any or all classes, group arranged for effect, Joseph H. White 15 00

ORNAMENTAL FOLIAGED PLANT. — Single specimen, named, not offered in any collection, Joseph H. White 5 00

Second, Dr. C. G. Weld 4 00

Third, Nathaniel T. Kidder 3 00

CALADIUMS. — Six named varieties, Nathaniel T. Kidder . . 6 00

Second, Dr. C. G. Weld 4 00

FERNS. — Six named varieties, no Adiantums admissible, Joseph H. White $10 00
Third, Dr. C. G. Weld 6 00
Specimen other than Tree Fern, Joseph H. White . . . 4 00
Second, E. S. Converse 3 00
ADIANTUMS. — Five named varieties, Joseph H. White . . . 8 00
Second, Dr. C. G. Weld 5 00
Third, John Jeffries 4 00
LYCOPODS. — Four named varieties, Dr. C. G. Weld . . . 5 00
DRACÆNAS. — Six named varieties, Dr. C. G. Weld . . . 8 00
Second, Nathaniel T. Kidder 6 00
CROTONS. — Six named varieties in not less than eight-inch pots, Dr. C. G. Weld 10 00
CYCAD. — Single plant, named, James L. Little 10 00
Second, J. W. Howard 8 00
Third, John L. Gardner 6 00
ORCHIDS. — Three plants, named varieties, in bloom, the second prize to John L. Gardner 8 00
BEGONIA REX. — Six pots of six varieties, E. S. Converse . . 6 00
Second, James L. Little 4 00
BEGONIAS. — Rex Hybrids, collection, named, James L. Little . 6 00
Second, W. S. Lincoln 4 00
CANNAS. — Collection of not less than ten named varieties, John Jeffries 10 00
Second, James L. Little 8 00
Third, J. W. Howard 6 00

Gratuities : —

Oakes Ames, *Stanhopea grandiflora* 2 00
B. Muto, Collection of Japanese Trees and Plants 20 00
Robert Cameron, Display of Plants 40 00
Joseph H. White, " " " 5 00
Dr. C. G. Weld, " " " 3 00
Charles H. Souther, " 3 00

SEPTEMBER 18.

Gratuity : —

John L. Gardner, Display 3 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 30 AND OCTOBER 1.

DECORATIVE PLANTS. — Display, not less than forty, not to exceed three feet in height, to be arranged by the Committee, William A. Bock 25 00
Second, John L. Gardner 20 00

Gratuity : —

E. S. Converse, Decorative Plants $20 00

OCTOBER 16.

Gratuities : —

John L. Gardner, Display of Orchids 6 00
James E. Rothwell, " " 4 00
Mrs. A. O. Simes, Wild Plants 1 00

OCTOBER 30.

James E. Rothwell, Display of Dendrobiums 2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 2, 3, 4, AND 5.

CHRYSANTHEMUMS. — Display of twelve named plants, any or all classes, distinct varieties, Nathaniel T. Kidder . . . 50 00
Second, Mrs. Benjamin P. Cheney 40 00
Third, Jason S. Bailey 30 00
Three Japanese Incurved, Mrs. Benjamin P. Cheney . . . 10 00
Three Reflexed, Mrs. Benjamin P. Cheney 10 00
Second, Nathaniel T. Kidder 7 00
Specimen Incurved, Nathaniel T. Kidder 6 00
Second, Mrs. Benjamin P. Cheney 5 00
Third, Nathaniel T. Kidder 4 00
Specimen Reflexed, Mrs. Benjamin P. Cheney 6 00
Specimen Anemone Flowered, Nathaniel T. Kidder . . . 6 00
Second, Mrs. Benjamin P. Cheney 5 00
Third, Nathaniel T. Kidder 4 00
Specimen Pompon, Mrs. Benjamin P. Cheney 4 00
Second, Nathaniel T. Kidder 3 00
Third, Nathaniel T. Kidder 2 00
Twelve plants of twelve different varieties, grown to one stem and bloom, in not over six-inch pots, preference being given to plants not more than three feet in height, Mrs. Arthur W. Blake . 10 00
Second, Mrs. Arthur W. Blake 8 00
Third, James L. Little 6 00
Fourth, E. S. Converse 4 00
Six plants grown as above, but all of one color, red, James L. Little 5 00
Second, E. S. Converse 4 00
White, Dr. C. G. Weld 5 00
Second, James L. Little 4 00
Third, James Nicol 3 00
Pink, Dr. C. G. Weld 5 00
Second, Dr. C. G. Weld 4 00
Third, James L. Little 3 00

Yellow, Dr. C. G. Weld	$5 00
Second, Charles H. Souther	4 00
Third, James L. Little	3 00
Six of any other color, Dr. C. G. Weld	5 00
Second, Dr. C. G. Weld	4 00
Group of Chrysanthemums arranged for effect, limited to one hundred square feet, and edged with ferns or low-growing decorative plants, Mrs. Arthur W. Blake	40 00
Second, Dr. C. G. Weld	35 00
Third, John L. Gardner	30 00
Fourth, J. W. Howard	25 00
Fifth, E. S. Converse	20 00

Gratuities : —

F. E. Palmer, *Nephrolepis exaltata*	4 00
W. P. Winsor, *Cypripedium insigne*	1 00
Jason S. Bailey, Display of Orchids	10 00
Dr. C. G. Weld, Display of Plants	3 00

DECEMBER 4.

Gratuity : —

Hon. C. G. Roebling, Trenton, N.J., four varieties of Cypripediums,	3 00

SOCIETY'S SILVER MEDALS.

Spring Exhibition, March 23–26. Mrs. B P. Cheney, for Superior Cultivation of Cyclamens.

May 1. Kenneth Finlayson, for Seedling Amaryllis.

" J. S. Bailey, for *Dendrobium nobile Baileyanum.*

May 15. J. E. Rothwell, for *Cypripedium bellatulum.*

Rose and Strawberry Exhibition, June 22 and 23. W. A. Manda, South Orange, N.J., for *Lælio-Cattleya Arnoldiana* var. *superba.*

" " " " " " J. E. Rothwell, for *Odontoglossum crispum* var. *virginale.*

" " " " " " John Mutch, for Superior Cultivation of Orchids.

July 3. J. E. Rothwell, for *Miltonia vexillaria.*

August 21. J. E. Rothwell, for Cypripedium Frau Ida Brandt.

Annual Exhibition of Plants and Flowers, Sept. 1 and 2. William Donald, for *Alocasia Sanderiana.*

" " " " " " J. E. Rothwell, for collection of Crotons.

November 20. W. W. Lunt, for *Cypripedium insigne* var. *Ernestii.*

December 4. F. L. Harris, for Begonia Gloire de Lorraine.

December 11. Hon. C. G. Roebling, Trenton, N.J., for *Cypripedium Lee-anum Clinkaberryanum.*

FIRST CLASS CERTIFICATES OF MERIT.

January 9. John L. Gardner, for *Primula stellata.*

February 6. George McWilliam, for Two Seedling Cymbidiums.

April 10. J. E. Rothwell, for *Cypripedium bellatulum.*

April 10. James Wheeler, for Seedling Azalea Mrs. Joseph H. White.

May 1. Donald McRea, for Superior Cultivation of *Mimulus* (*Diplacus*) *glutinosus.*

July 31. J. E. Rothwell, for *Cypripedium Corningii.*

Annual Exhibition of Plants and Flowers, Sept. 1 and 2. Dr. C. G. Weld, for *Heliconia illustris rubicolus.*

December 4. Hon. C. G. Roebling, Trenton, N.J., for *Cypripedium Niobe superbissima.*

HONORABLE MENTION.

January 16. Oakes Ames, for Display of Cypripediums.

Spring Exhibition, March 23–26. W. A. Manda, South Orange, N.J., for New Foliage Canna.

May 15. R. & J. Farquhar & Co., for New Bedding Begonia, *Begonia erecta compacta multiflora.*

July 3. W. E. Coburn, for Pelargonium Dorothy.

Annual Exhibition of Plants and Flowers, September 1 and 2. J. E. Rothwell, for Collection of Orchids.

REPORT

OF THE

COMMITTEE ON FLOWERS,

FOR THE YEAR 1897.

By J. WOODWARD MANNING, Chairman.

Your Committee beg leave to make the following report:

The season of 1897 has brought forth a larger number of exhibitions than in the past, and has been remarkable in many respects for the quantity and quality of the flowers exhibited. The Lower Hall has been taxed to its utmost capacity on nearly every occasion when prizes have been offered for important classes of flowers. While the abnormally cool weather conditions of the early part of the summer retarded the development of the flowers, abundant later rains produced, on the whole, a greater quantity and better quality of flowers than in the past; yet in some classes this served to develop diseases to an unusual degree, this being especially true of Hollyhocks, which, presumably for this cause, were shown in scanty numbers.

Your Committee have found it necessary, in view of the continued increase of exhibits other than those for which regular prizes are scheduled, to reduce very materially the gratuities that have in the past been awarded for such outside exhibits. This experience has made it evident that it will be necessary to reduce even to a larger extent the amount of such gratuities; in fact, it seems almost necessary to award Certificates in the place of money prizes in the near future, unless a larger appropriation can be arranged.

The exhibits of Native Plants have increased in number and have taxed the capacity of the hall, especially when exhibited in

connection with the strictly horticultural exhibitions. For that reason your Committee deem it wise that special space be granted such native plant exhibits, and would suggest the use of the Upper Hall on all days when they would not interfere with business meetings or other uses. These exhibits have created a great deal of interest and form a very significant feature of the exhibitions to a large portion of the visiting public. Extension in this line would be desirable, and your Committee feel that it would be no more than right that the exhibitors should be given ample space in which to display their collections. While your Committee, with the addition of a botanical expert to its number, have found less difficulty in making awards the past season, still they deem it wise that a Special Committee should be appointed to judge the Native Plant exhibits. They being of a strictly botanical nature, it would seem that a Committee composed exclusively of botanists would be better able to judge of the comparative rarity and educational value of the exhibits than would a Committee composed chiefly of horticulturists. For that reason we would recommend that a Special Committee, working on such lines as do the present Committee on School Gardens and Children's Herbariums, be appointed with the same powers and privileges, and that a special appropriation be set aside for their use in awarding such prizes as may be scheduled and such gratuities as they may deem wise.

On January 16 Kenneth Finlayson, gardener to Dr. C. G. Weld, made a very creditable exhibition of Hippeastrums, *Erica Wilmoreana*, *Streptosolen speciosum major*, *S. Jamesonii*, *Epacris hyacinthiflora*, *Phalœnopsis Schilleriana*, and *Centropogon Lucyanus*. On the same day, Hugh Graham, of Philadelphia, Pa., exhibited a new Carnation, Victor, for which your Committee awarded Honorable Mention.

The following Saturday, January 23, H. A. Cook exhibited the new Carnation Nivea, for which a First Class Certificate of Merit was awarded.

The exhibition of Orchids on February 6 called forth a close competition, and was very creditable to the exhibitors.

February 20 *Hemerocallis aurantiaca major* was exhibited by Jacob W. Manning as a new hardy Japanese Hemerocallis or Day Lily, and received a First Class Certificate of Merit.

SPRING EXHIBITION.

March 23, 24, 25, and 26.

At this exhibition the competition for most of the prizes offered for Roses was close; the quality of the specimens has never been surpassed, and the display was in all respects extremely satisfactory. Carnations also were shown in unusual quantity and of the best quality, while Violets were shown in great abundance and perfection. James Comley exhibited a forced branch of a new variety of Japanese Flowering Cherry which was of remarkable character in its abundance of very double, pure white, pendulous flowers, hanging in clusters the length of the branch. This was very unique and was awarded a Silver Medal.

MAY EXHIBITION.

May 1.

Pansies, Narcissuses, and Tulips were at this time shown in abundance and made a most creditable display. Native Plants were first entered at this time and continued at intervals for the remainder of the year.

May 22, Carl Jurgens, of Newport, R.I., exhibited forced flowers of *Convallaria prolificans*, which attracted a great deal of attention, and for their very apparent value were awarded a Silver Medal by the Committee. At the same exhibition the Miellez Horticultural Company exhibited two vases of Lily of the Valley, which, for their superior culture, were awarded a First Class Certificate of Merit.

RHODODENDRON SHOW.

June 3 and 4.

Although the weather conditions up to this date had not been propitious, the show of Rhododendrons and Azaleas was very fine and the quality of the flowers seemed fully up to that of previous years. At this time Oriental Poppies, German Irises, and Aquilegias were shown in quantity and great variety, and of fine quality. T. C. Thurlow made a very creditable exhibit of named Hardy Trees and Shrubs, among which particular mention should be made of *Cornus florida* var. *rubra* and a choice variety of Mag-

nolias. One of the most attractive features of this exhibition was a collection of Orchids by Henry T. Clinkaberry, gardener to Hon. C. G. Roebling, of Trenton, N.J. This exhibit attracted a great deal of attention, and for its great diversity and the unique character of many of the individual flowers was deemed worthy of the Appleton Gold Medal. A First Class Certificate of Merit was also awarded the same exhibitor for the fine hybrid Orchid, Laelio-Cattleya C. G. Roebling. W. A. Manda, of South Orange, N.J., was also awarded a First Class Certificate of Merit for superior culture shown in a spike of *Laelia purpurata* var. *South Orangiensis*, and also for *Lilium longiflorum* var. *foliis alba marginata*. To James Comley, Honorable Mention was given for the new Hardy Rhododendron William Power Wilson, and a Silver Medal for the variety James Comley.

PÆONY SHOW.

June 12.

In many respects this was the most remarkable exhibition of the year. The Hall was amply filled with flowers grown to the height of perfection and displayed to the best possible advantage. The beauty and development of the individual flowers gave evidence of the highest possible culture on the part of the exhibitors, while their wide range of color was full testimony to the great value of this absolutely hardy garden plant, and seemed to make manifest the immense popularity that must soon ensue for these flowers. The Kelway Silver Gilt Medal was gained by Kenneth Finlayson, gardener to Dr. C. G. Weld, while the Kelway Bronze Medal was awarded to T. C. Thurlow. A First Class Certificate of Merit was awarded to George Hollis, for the new Seedling Pæony George Washington.

ROSE AND STRAWBERRY EXHIBITION.

June 22 and 23.

The display of Roses was disappointing in many respects, owing to lack of fully developed flowers due to the cold weather and heavy rains that had occurred just previous to that date. The following Saturday, however, they were shown in ample quantity and of the highest quality.

June 22, Honorable Mention was given W. A. Manda, of South Orange, N.J., for *Lælia elegans Mandiana*, and a First Class Certificate of Merit was awarded the same person for two new Hybrid Roses, the first being a cross between *Rosa Wichuraiana* and Perle des Jardins; the second a cross between *Rosa Wichuraiana* and Madame Hoste. Both show great possibilities for future culture. A Silver Medal was awarded to M. H. Walsh for the White Rose Lilian Nordica, and on the following day a First Class Certificate of Merit was awarded to him for the new Rose Joseph S. Fay.

The display of Delphiniums on June 26 was the finest that has been made for several years past. The spikes were of perfect quality and showed great range of color. On this date Robert Cameron, gardener to the Botanic Garden of Harvard University, made a remarkable exhibit of Hardy Herbaceous Perennials, well worthy of a larger gratuity than your Committee, owing to the limited amount of the appropriation, felt able to award.

July 3, the display of Iris Kæmpferi did not compare favorably with exhibits of former years, while Shirley Poppies, English Irises, and *Lilium candidum* unfortunately had been seriously affected by bad weather and other unfavorable conditions, and were not shown at all. The display of *Campanula Medium*, however, was undoubtedly the finest that has been made in the Hall. William Thatcher, gardener to John L. Gardner, is deserving of great praise for the high character of the spikes shown. T. C. Thurlow on this date exhibited *Rhus Cotinus atropurpureus*, which was especially distinct from other types in the deeper purplish effect of its sprays of seed vessels, and which your Committee deemed worthy of a First Class Certificate of Merit. On this date also, Walter H. Cowing exhibited *Rosa lucida alba*, a pure white and very fragrant variety of our ordinary *Rosa lucida*, and for this a First Class Certificate of Merit was awarded.

July 10, Hollyhocks were not exhibited, this being due, presumably, to the ravages of the Hollyhock disease, which seems to have made serious inroads upon all those collections which in the past have contributed so effectively to our exhibitions. On that day, James Wheeler, gardener to Joseph H. White, made a remarkable display of ninety varieties of Sweet Peas, all correctly named, and displayed in such a manner as to show the comparative difference as well as the merits of each particular variety. This

exhibit was most effective and elicited a great deal of praise. William Thatcher, gardener to John L. Gardner, exhibited a new seedling Delphinium, nearly pure white, for which Honorable Mention was awarded.

The postponement of the Hollyhock prizes until July 17 did not gain the exhibits hoped for, and none were deemed worthy of the first prize.

The exhibits of Sweet Peas on July 24 were ample and well shown, although weather conditions had been somewhat disadvantageous to individual flowers. However, distinct advancement in many of the newer sorts was evident, and the coming year will, with favorable weather conditions, undoubtedly assist in producing effective exhibits in this class. At this time, James Greene, gardener to James L. Little, exhibited flowers of *Begonia Haageana* which, for their abundance and unique character, were deemed worthy of a First Class Certificate of Merit. Robert Cameron, gardener to the Botanic Garden of Harvard University, displayed fruits of *Podophyllum Emodi*, whose unique character and ornamental effect gained for them a First Class Certificate of Merit. Hardy Perennial Phloxes were not shown to as good advantage this year as in the past, owing to abundant rains, which seriously interfered with the perfection of the panicles.

August 7, the display of Annuals resulted in very close competition. A large portion of the Hall was filled and the character of the exhibits was of the best. Unfortunately Gladioli were not shown to as good advantage this year as in the past. We hope another season may bring a change in this respect. *Montbretia crocosmiflora* was shown both by the Bussey Institution and Judge C. W. Hoitt, of Nashua, N.H., and made a very interesting exhibit. This class of Hardy Bulbs should be far more widely cultivated than in the past. Its brilliancy of color, abundance of bloom, and ease of culture are valuable characteristics.

AQUATIC EXHIBITION.

August 21.

This was held in the Upper Hall, several tanks being filled to repletion, and the exhibits commanded close attention from a large number of visitors. The same day the prizes for China Asters were closely competed for by a number of exhibitors, and decided

advancement was shown in the class. At this time a Silver Medal was awarded to Henry A. Dreer, of Philadelphia, Pa., for a remarkable collection of Cannas, among which the Canna Allemania was deemed worthy of a First Class Certificate of Merit. In addition, this gentleman exhibited the new pure white Gladiolus called White Lady, for which also a First Class Certificate of Merit was awarded, and a choice collection of double and fringed Petunias was given Honorable Mention, while Nymphæa Falconeri was allotted a First Class Certificate of Merit. Honorable Mention was given George Hollis for a sport of *Vallota purpurea*, which was quite distinct in color from the ordinary type, and of larger size.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

September 1 and 2.

Not for many years past has there been such an increase of exhibits of Dahlias as at this show. The quality of the blooms was indicative of careful culture on the part of the exhibitors, while the quantity was ample evidence of the esteem in which this flower is held by the public at the present time. This exhibition was in many respects a surprise. Although your Committee recognized the fact that the Dahlia is fast coming to the front again and regaining its past eminence, yet they regret to find the appropriation set aside for the special use of this class so comparatively small.

September 11, there was shown a pure white form of *Aster Novæ-Angliæ*, for which a First Class Certificate of Merit was awarded Robert Cameron, gardener at the Botanic Garden of Harvard University.

Robert Laurie, gardener to Cornelius Vanderbilt, of Newport, R.I., made a very creditable display of Fringed Tuberous Begonias. These obtained Honorable Mention.

September 18, a display of Perennial Asters called forth close competition, and the Hall was well filled. On this date also, a noteworthy collection of ornamental fruit and hardy trees was made by Jackson Dawson, Superintendent of the Arnold Arboretum.

The exhibition of Early Flowering Chrysanthemums scheduled under October 16 did not bring the competition that was expected, and although several creditable entries were made, your Committee regret that greater competition was not evident.

CHRYSANTHEMUM SHOW.

November 2, 3, 4, and 5.

All things considered, this was undoubtedly the finest exhibition of Chrysanthemums ever made in our Halls. There were a greater number of entries, and the character of the flowers was seemingly perfect in all of the double blooming varieties. All the tables were closely filled, and the capacity of the Hall was taxed to its utmost. All exhibitors seemed to vie in giving their plants the highest culture. As a result, competition was extremely close and the general tone of the exhibition was immensely improved. The classes of twenty-five varieties were very closely competed for. The vases of cut blooms gave a remarkable effect upon entering the Hall, while nearly every scheduled prize was taken. As a result the surplus that would otherwise return to the Committee to help meet gratuities awarded during the year was very small, and in consequence your Committee find the appropriation nearly exhausted at the end of the year, and they cannot but reiterate the hope that a larger appropriation can be spared by the Society for the use of the Flower Committee, feeling as they do that this would enable them to award gratuities to exhibitors more nearly in proportion to the value of their exhibits. At this show, Arthur Griffin, gardener to J. J. Van Alen, of Newport, R.I., exhibited an improved strain of seedling *Begonia semperflorens* in which a great range of color was apparent. For this a Silver Medal was given.

M. H. Walsh has entered his new seedling Rose, Lilian Nordica, for the Prospective Prize.

The amount appropriated for the year 1897 was .	$2,600 00
Awards of prizes and gratuities have been made to the amount of	2,514 00
Leaving an unexpended balance of . . .	$86 00

All of which is respectfully submitted.

J. Woodward Manning,
George E. Davenport,
M. H. Norton,
Frederick S. Davis,
Committee on Flowers.

PRIZES AND GRATUITIES AWARDED FOR FLOWERS.

1897.

January 2.

Gratuities : —

James Comley, Display $5 00
Mrs. E. M. Gill, " 1 00

January 9.

Chinese Primroses. — Display of fifty or more individual blooms,
Mrs. Benjamin P. Cheney 2 00
Second, I. E. Coburn 1 00

Gratuities : —

James Comley, Display of Camellias and Orchids 3 00
W. N. Craig, Vase of Cypripediums 2 00
W. N. Craig, Vase of *Freesia refracta* 1 00
Mrs. E. M. Gill, Vase of Flowers 1 00
Mrs. P. D. Richards, Display of Mosses and Ferns . . . 2 00

January 16.

Gratuities : —

Kenneth Finlayson, Display of Flowers 3 00
James Comley, Display of Camellias 2 00

January 23.

Gratuities : —

W. E. Coburn, cut blooms of Chinese Primulas 2 00
Mrs. E. M. Gill, Display of Flowers 1 00

January 30.

Gratuities : —

Oakes Ames, Display of Flowers 3 00
James Comley, " " " 1 00

February 6.

Orchids. — Display of named species and varieties, filling not less than twenty bottles, E. O. Orpet 15 00
Second, William Thatcher 10 00
Violets. — Best collection of varieties, fifty blooms of each in a bunch, Alexander McKay 4 00
Second, Nathaniel T. Kidder 3 00
Carnations. — Display of cut blooms, with foliage, not less than six varieties, William Nicholson 8 00

Camellias. — Display of named varieties, cut flowers with foliage, not less than twelve blooms, of not less than six varieties, James Comley $4 00
Second, James Comley 3 00

Gratuities: —
James Comley, Display of Flowers 3 00
Joseph J. Comley, two vases of Roses — Bride and Bridesmaid . 2 00
John L. Bird, Display of *Acacia pubescens* 1 00
Walter E. Coburn, Display of Chinese Primroses 1 00
Mrs. E. M. Gill, Display 1 00

February 13.

Gratuities: —
James Comley, Vase of *Cœlogyne cristata* 3 00
James Comley, Display of California Violets 1 00

February 20.

Gratuities: —
James Comley, Display 4 00
Oakes Ames, " 3 00
Mrs. E. M. Gill, " 1 00

February 27.

Gratuities: —
James Comley, Basket of Flowers and Display 3 00
Mrs. E. M. Gill, Display of Flowers 1 00

March 6.

Gratuity: —
James Comley, Display 3 00

SPRING EXHIBITION.

March 23, 24, 25, and 26.

Hybrid Perpetual Roses. — Twelve blooms, of not less than four distinct named varieties, David Nevins 12 00
Second, James Comley 10 00
Six blooms, not less than three named varieties, David Nevins . 6 00
Second, James Comley 5 00
Twelve blooms of Ulrich Brunner, David Nevins . . . 10 00
Tender Roses in Vases. — Twelve blooms of American Beauty, F. R. Pierson & Co., Tarrytown, N.Y. 15 00
Twenty-five blooms of Bridesmaid, William H. Elliott . . . 12 00
Second, Robert McGoram 10 00
Twenty-five blooms of Meteor, F. R. Pierson & Co. . . . 12 00
Twenty-five blooms of Souvenir de Président Carnot, F. R. Pierson & Co. 12 00

Twenty-five blooms of The Bride, William H. Elliott	$12 00
Second, Robert McGoram	10 00
Twenty-five blooms of Papa Gontier, William H. Elliott	8 00
Second, William H. Elliott	6 00
Vase of fifty blooms, assorted varieties, David Nevins	20 00
CARNATIONS. — Vase of one hundred cut blooms with foliage, not less than six varieties, William Nicholson	10 00
Third, William H. Elliott	8 00
Twenty-five blooms of any named Crimson variety, William Nicholson	4 00
Twenty-five blooms of any named Dark Pink variety, William Nicholson for William Scott	4 00
Twenty-five blooms of any named Light Pink variety, William Nicholson for Daybreak	4 00
Second, Peter Fisher for Daybreak	3 00
Twenty-five blooms of any named Scarlet variety, William Nicholson for Hector	4 00
Twenty-five blooms of any named White variety, H. A. Cook for Nivea	4 00
Second, Peter Fisher for Freedom	3 00
Twenty-five blooms of any named Yellow variety, William Nicholson for Eldorado	4 00
VIOLETS. — Bunch of fifty blooms of California, David Nevins	3 00
Second, James Comley	2 00
Bunch of fifty blooms of Lady Hume Campbell, David Nevins	3 00
Second, Joseph H. White	2 00
Bunch of fifty blooms of Marie Louise, David Nevins	3 00
Second, Joseph H. White	2 00
Bunch of fifty blooms of any other variety, David Nevins for Farquhar	3 00
Second, David Nevins for Swanley White	2 00
ANTIRRHINUMS. — Display, not less than three distinct varieties, Mrs. E. M. Gill	4 00
Second, John Jeffries	2 00
CAMELLIAS. — Display of named varieties, cut flowers with foliage, not less than twenty-four blooms of not less than six varieties, Joseph H. White	4 00
Second, James Comley	3 00

Gratuities: —

David Nevins, Display of Hardy Perpetual Roses	20 00
William E. Doyle, " of Lady Hume Campbell Violets	2 00
Jason S. Bailey, " of Carnations	1 00
David Nevins, " of Orchids	1 00
James L. Little, " of Streptocarpus	1 00
James Comley, "	5 00
Mrs. E. M. Gill, "	2 00

April 3.

Gratuities: —

James Comley, Display of Cut Flowers $3 00
Mrs. E. M. Gill, " " " " 1 00

April 10.

Gratuity: —

James Comley, Display of Azaleas 3 00

April 17.

Gratuity: —

Mrs. P. D. Richards, Display of Native Plants 1 00

April 24.

Gratuities: —

Mrs. P. D. Richards, Display of Native Plants 1 00
Miss Vivien May Norris, " " " " 1 00

MAY EXHIBITION.

May 1.

Tulips. — Twenty-four blooms, distinct named varieties, Bussey Institution 4 00
Second, Kenneth Finlayson 2 00

Hardy Narcissuses. — Collection of not less than ten named varieties of blooms, Kenneth Finlayson 5 00
Second, Bussey Institution 4 00
Third, W. N. Craig 3 00

Pansies. — Forty-eight blooms, not less than twenty-four varieties, Hon. Joseph S. Fay 4 00
Second, Hon. Joseph S. Fay 3 00
Third, Mrs. E. M. Gill 2 00

Native Plants. — Collection of thirty bottles of named species and varieties, one bottle of each, Mrs. P. D. Richards . . . 8 00
Second, Miss Genevieve Doran 6 00
Third, Mrs. Kate E. Parker 4 00

Gratuities: —

Bussey Institution, Display of Tulips 2 00
Hon. Joseph S. Fay, Display of Pansies 1 00
Rea Brothers, Display of Hardy Perennials 1 00
Kenneth Finlayson, Display 3 00
Mrs. E. M. Gill, " 3 00
James Comley, " 3 00
W. N. Craig, " 2 00
John Jeffries, " 1 00
Oakes Ames, " 1 00
Mrs. Kate E. Parker, Display of Native Plants 1 00

MAY 8.

Gratuities: —

James Comley, Flowering Shrubs	$3 00
Mrs. P. D. Richards, Native Plants	2 00

MAY 15.

Gratuities: —

Bussey Institution, Display of Late Tulips	3 00
Kenneth Finlayson, Tulips	2 00
Joseph S. Chase, "	1 00
James Comley, Collection	3 00
Mrs. E. M. Gill, Display	2 00
Mrs. P. D. Richards, Native Plants	3 00

MAY 22.

TREE PÆONIES. — Collection of Single and Double varieties, named, Thomas C. Thurlow	6 00
Second, James Comley	4 00
HERBACEOUS PLANTS. — Thirty bottles, Jacob W. Manning	8 00

Gratuities: —

Thomas C. Thurlow, Collection of Hardy Shrubs	5 00
Charles H. Souther, Gloxinias	2 00
Carl Jurgens, Lily of the Valley	2 00
Jacob W. Manning, Display	2 00
James Comley, "	2 00
Mrs. E. M. Gill, "	1 00
Mrs. P. D. Richards, Wild Flowers	2 00
Miss Eleanor Doran, " "	1 00
Miss Vivien May Norris, Collection of Plants	1 00

MAY 29.

Gratuities: —

H. H. Hunnewell, Display of Rhododendrons	25 00
Miss Vivien May Norris, Native Plants	2 00

RHODODENDRON EXHIBITION.

JUNE 3 AND 4.

H. H. Hunnewell Fund.

RHODODENDRONS. — Twelve distinct varieties of unquestioned hardiness, named, James Comley	20 00
Second, John L. Gardner	15 00
Six distinct varieties of unquestioned hardiness, named, Kenneth Finlayson	10 00
Second, Mrs. Arthur W. Blake	5 00
Eighteen Tender varieties, named, James Comley	10 00

Six Tender varieties, named, James Comley	$5 00
Second, John L. Gardner	4 00
Three Tender varieties, named, James Comley	4 00
Second, Kenneth Finlayson	3 00
Hardy Azaleas, from any or all Classes. — Fifteen varieties, one vase of each, James Comley	8 00
Second, Thomas C. Thurlow	5 00
Six varieties, one vase of each, John L. Gardner	3 00
Second, James Comley	2 00
Cluster of trusses of one variety, Thomas C. Thurlow	2 00
Second, John L. Gardner	1 00

Society's Prizes.

Herbaceous Pæonies. — Collection of named varieties, the second prize to Thomas C. Thurlow	4 00
German Irises. — Twelve distinct varieties, three spikes of each, John L. Gardner	3 00
Second, Walter H. Cowing	2 00
Oriental Poppies. — Collection, named, Walter H. Cowing	3 00
Second, W. N. Craig	2 00
Aquilegias. — Collection, Frederick S. Davis	3 00
Second, Kenneth Finlayson	2 00
Third, Walter H. Cowing	1 00
Hardy Ornamental Trees and Shrubs. — Collection of not less than thirty species and varieties, named, cut blooms or foliage, Thomas C. Thurlow	8 00
Native Plants. — Collection of thirty bottles of named species and varieties, one bottle of each, Mrs. P. D. Richards	8 00
Second, Mrs. Kate E. Parker	6 00
Third, Miss Genevieve Doran	4 00
Vase of Flowers, Mrs. E. M. Gill	4 00

Gratuities : —

H. H. Hunnewell, Azaleas and Rhododendrons	30 00
James Comley, Rhododendrons, Azaleas, etc.	20 00
Mrs. Benjamin P. Cheney, Rhododendrons, etc.	8 00
Kenneth Finlayson, Rhododendrons, etc.	5 00
Thomas C. Thurlow, Display of Azaleas and Rhododendrons	3 00
W. A. Manda, Collection of Orchids	5 00
William Nicholson, Vase of Carnations	3 00
Bussey Institution, Tulips and Irises	1 00
John Jeffries, Display	3 00
Mrs. A. D. Wood, Display	2 00
W. N. Craig, "	2 00
Mrs. E. M. Gill, "	1 00

JUNE 12.

FOXGLOVES. — Twelve spikes, Kenneth Finlayson $3 00
Second, W. N. Craig 2 00
Third, John L. Gardner 1 00

Gratuities : —

James Comley, Rhododendrons, Azaleas, and other Shrubs, etc. . 15 00
Hon. Joseph S. Fay, Flowering Shrubs 7 00
Thomas C. Thurlow, Pæonies and Shrubs 5 00
George Hollis, Pæonies 3 00
John L. Gardner, Pæonies 2 00
Joseph S. Chase, Vase of Pæonies 1 00
W. N. Craig, Display of Carnations and Pæonies 3 00
Thomas W. Dee, Late Flowering Tulips 2 00
Mrs. E. M. Gill, Display 3 00
Mrs. P. D. Richards, Native Plants 1 00

JUNE 19.

HERBACEOUS PÆONIES. — Collection of named varieties, Double, Kenneth Finlayson 12 00
Second, Thomas C. Thurlow 10 00
Third, George Hollis 8 00
Collection of named varieties, Single, Thomas C. Thurlow . . 6 00
Third, George Hollis 4 00
Specimen bloom, Kenneth Finlayson, for Blanche Neige . . 2 00
Second, Kenneth Finlayson, for Model of Perfection . . 1 00
Vase of blooms, on long stems, arranged for effect, Kenneth Finlayson 8 00
Second, M. H. Walsh 6 00

Gratuities : —

M. H. Walsh, Display of Roses and Pæonies 6 00
Charles H. Souther, Display of Pæonies 1 00
Mrs. E. M. Gill, " " " 1 00
Mrs. E. M. Gill, " " Roses 1 00
James Comley, " 10 00
Thomas C. Thurlow, " 3 00
Mrs. A. A. Johnson, " 1 00
Miss C. M. Endicott, " " Alpine Plants 2 00

ROSE EXHIBITION.

JUNE 22 AND 23.

Special Prizes, Theodore Lyman Fund.

HARDY ROSES. — Twenty-four distinct named varieties, three of each variety, Estate of Joseph S. Fay 25 00

Second, Estate of Joseph S. Fay $20 00
Third, Miss Eleanor J. Clark, Pomfret Centre, Conn. . . 15 00

Society's Prizes.

Sixteen distinct named varieties, three of each variety, Kenneth Finlayson 15 00
Second, Estate of Joseph S. Fay 10 00
Twelve distinct named varieties, three of each, the second prize to the Estate of Joseph S. Fay 8 00
Six distinct named varieties, three of each, the second prize to the Estate of Joseph S. Fay 4 00
Third, Miss Eleanor J. Clark 2 00
Twenty-four distinct named varieties, one of each, the second prize to Miss Eleanor J. Clark 8 00
Third, Estate of Joseph S. Fay 6 00
Eighteen distinct named varieties, one of each, the second prize to the Estate of Joseph S. Fay 6 00
Third, Miss Eleanor J. Clark 4 00
Twelve distinct named varieties, one of each, Kenneth Finlayson . 6 00
Six distinct named varieties, one of each, W. N. Craig . . 4 00
Second, Estate of Joseph S. Fay 3 00
Third, Kenneth Finlayson 2 00
Twenty-four blooms of Mme. Gabriel Luizet, Miss Eleanor J. Clark 8 00
Second, Estate of Joseph S. Fay 6 00
Third, Kenneth Finlayson 4 00
Six blooms of John Hopper, the second prize to Kenneth Finlayson, 2 00
Six blooms of Marquise de Castellane, the second prize to Patrick Kane 2 00
Twelve blooms of any other variety, Kenneth Finlayson . . 4 00
Second, W. N. Craig 3 00
Best single bloom of a variety introduced since 1893, Miss Eleanor J. Clark 3 00
Moss Roses. — Six distinct named varieties, three clusters of each, John L. Gardner 3 00
Second, Estate of Joseph S. Fay 2 00
General Display. — One hundred bottles of Hardy Roses, buds admissible, W. N. Craig 10 00
Second, Kenneth Finlayson 9 00
Third, Mrs. E. M. Gill 8 00
Fourth, Miss Eleanor J. Clark 7 00
Fifth, Estate of Joseph S. Fay 6 00
Sixth, William H. Spooner 5 00
Sweet Williams. — Thirty spikes, not less than six distinct varieties, Bussey Institution 4 00
Second, W. N. Craig 3 00
Third, Miss Mary S. Walker 2 00
Fourth, Charles H. Souther 1 00

SPANISH IRISES. — Collection, named, the second prize to the Bussey Institution $2 00

VASE OF FLOWERS. — Best arranged, in one of the Society's glass vases, the second prize to Miss Genevieve Doran . . . 4 00

Gratuities : —

Miss Eleanor J. Clark, Display of General Jacqueminot Roses . 8 00
William H. Spooner, Display of Roses 1 00
Thomas C. Thurlow, seventy-two varieties of Pæonies . . . 7 00
Carl Blomberg, Hardy Flowers 2 00
Rea Brothers, Hardy Perennials and Tuberous Begonias . . . 2 00
L. W. Goodell, two tubs of Aquatics 5 00
James Comley, Display 7 00
Patrick Kane, " 3 00
Mrs. E. M. Gill, " 3 00
Nathaniel T. Kidder, " 2 00
Estate of Joseph S. Fay, " 2 00
W. N. Craig, " 1 00
William C. Winter, " 1 00
Mrs. E. A. Wilkie, " 1 00
Mrs. P. D. Richards, Native Plants 2 00

JUNE 26.

HARDY ROSES. — Collection, named, not less than twenty-five varieties, filling fifty vases, Estate of Joseph S. Fay . . . 15 00
Second, Estate of Joseph S. Fay 10 00
Third, Kenneth Finlayson 6 00
Fourth, Estate of Joseph S. Fay 4 00

SWEET WILLIAMS. — Auricula flowered, ten spikes of ten distinct varieties, the second prize to Carl Blomberg 2 00

DELPHINIUMS. — Collection of twenty spikes, not less than five varieties, John L. Gardner 5 00
Second, Kenneth Finlayson 4 00

HERBACEOUS PLANTS. — Thirty bottles, Nathaniel T. Kidder . . 8 00
Second, Jacob W. Manning 6 00
Third, Rea Brothers 4 00

VASE OF FLOWERS. — Mrs. E. M. Gill 4 00
Second, Miss Hattie B. Winter 3 00

Gratuities : —

Robert Cameron, Hardy Herbaceous Plants 10 00
W. N. Craig, Display of Roses and Sweet Williams . . . 3 00
Edwin Sheppard, Sweet Williams 2 00
Mrs. E. A. Wilkie, Vases of Roses 1 00
Thomas Kane, Roses 1 00
John Jeffries, Pæonies 1 00

Estate of Joseph S. Fay, Display	$6 00
Estate of Joseph S. Fay, "	6 00
James Comley, "	6 00
J. Eaton, Jr., "	3 00
Mrs. E. M. Gill, "	3 00

JULY 3.

IRIS KÆMPFERI. — Fifteen varieties, three of each, John L. Gardner,	6 00
Six varieties, three of each, Miss Mary S. Walker	4 00
Second, John L. Gardner	3 00
CAMPANULA MEDIUM. — Collection, not less than twelve bottles, John L. Gardner	3 00
Second, Bussey Institution	2 00

Gratuities: —

Estate of Joseph S. Fay, Roses	7 00
Estate of Joseph S. Fay, Sweet Williams	3 00
W. E. Coburn, Sweet Williams	1 00
John L. Gardner, Delphiniums	3 00
John L. Gardner, Iris Kæmpferi	2 00
John L. Gardner, Phlox Miss Lingard	1 00
Rea Brothers, Hardy Perennials	2 00
Thomas C. Thurlow, Pæonies, etc.	2 00
James Comley, Display	5 00
Mrs. E. M. Gill, "	3 00
Mrs. A. D. Wood, "	1 00
Mrs. P. D. Richards, Native Flowers	2 00

JULY 10.

HOLLYHOCKS. — Single, twelve spikes, the second prize to John L. Gardner	3 00
NATIVE PLANTS. — Collection, not exceeding forty bottles of named species and varieties, one bottle of each, Mrs. P. D. Richards	8 00
Second, Misses Eleanor and Mollie Doran	6 00
Third, Miss Helen M. Noyes	4 00
VASE OF FLOWERS. — Best arranged, in one of the Society's glass vases, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

Gratuities: —

Joseph H. White, Display of ninety varieties of Sweet Peas	5 00
John L. Gardner, Japanese Irises	3 00
John L. Gardner, Stocks	2 00
John L. Gardner, Display of Poppies	1 00
James Comley, Japanese Irises	2 00

William H. Spooner, Rose Bardon Job	$1 00
James Comley, Display	3 00
Rea Brothers, "	2 00
W. N. Craig, "	2 00

JULY 17.

HOLLYHOCKS. — Double, twelve blooms of twelve distinct colors, the third prize to the Estate of Joseph S. Fay	3 00
Double, six blooms, of six distinct colors, the second prize to the Estate of Joseph S. Fay	2 00
Third, Estate of Joseph S. Fay	1 00
GLOXINIAS. — Twelve vases, cut blooms, three in each vase, arranged with any foliage, Kenneth Finlayson	5 00
Second, Kenneth Finlayson	4 00
Third, James L. Little	3 00
TUBEROUS BEGONIAS. — Collection, arranged with their own foliage, James L. Little	4 00
Third, E. S. Converse	2 00
HARDY AQUATIC FLOWERS. — Collection, named, Carl Blomberg	10 00
HARDY FERNS. — Display of named species and varieties, Mrs. P. D. Richards	7 00
Second, Carl Blomberg	5 00
Gratuities: —	
John L. Gardner, Hardy Phlox	2 00
Rea Brothers, Hardy Perennials	1 00
Estate of Joseph S. Fay, Display	3 00
W. N. Craig, "	1 00
Mrs. E. M. Gill, "	1 00

JULY 24.

SWEET PEAS. — Display of named varieties, filling thirty vases, arranged with any foliage, Marshall B. Faxon	6 00
Second, Mrs. H. A. Jones	4 00
Display of named varieties in vases, six sprays in each vase, Joseph H. White	4 00
Second, E. A. Weeks	3 00
Third, Mrs. H. A. Jones	2 00
HERBACEOUS PLANTS. — Thirty bottles, Nathaniel T. Kidder	8 00
Second, Jacob W. Manning	6 00
Third, Carl Blomberg	4 00
VASE OF FLOWERS. — For table decoration, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00
Gratuities: —	
Marshall B. Faxon, Display of Sweet Peas	2 00
Botanic Garden of Harvard University, Hardy Perennials	8 00

John L. Gardner, Display	$3 00
James Comley, "	2 00
James L. Little, "	2 00
Mrs. A. D. Wood, "	1 00
Mrs. P. D. Richards, Native Plants	2 00
Misses Eleanor and Mollie Doran, Native Plants	1 00

JULY 31.

PERENNIAL PHLOXES. — Eighteen distinct named varieties, one spike of each, the second prize to John L. Gardner	5 00
ANTIRRHINUMS. — Display of thirty vases, three spikes in each, the second prize to John Jeffries	3 00
Third, Carl Blomberg	2 00
NATIVE FLOWERS. — Collection, not exceeding forty bottles of named species and varieties, one bottle of each, Mrs. P. D. Richards	8 00
Second, Misses Eleanor and Mollie Doran	6 00
Third, Miss Genevieve Doran	4 00
Gratuities: —	
Marshall B. Faxon, Sweet Peas	2 00
Bussey Institution, *Montbretia crocosmiflora*	1 00
J. Warren Clark, Gladioli	1 00
John L. Gardner, Display	3 00
James Comley, "	3 00
Mrs. E. M. Gill, "	1 00
Rea Brothers, "	1 00
Carl Blomberg, Display of Native Plants	2 00
John Jeffries, Native Plants	1 00

AUGUST 7.

ANNUALS. — General display, named, filling not less than one hundred and fifty bottles, John L. Gardner	10 00
Second, Carl Blomberg	8 00
Third, Charles H. Souther	6 00
Gratuities: —	
J. Warren Clark, Gladioli	1 00
W. N. Craig, Display	2 00
James Comley, "	2 00

AUGUST 14.

GLADIOLI. — Ten named varieties, in spikes, the second prize to John Parker	2 00
Display of named and unnamed varieties, filling one hundred vases, arranged for effect, with any foliage, J. Warren Clark,	8 00

MONTBRETIA CROCOSMIFLORA. — Display in vases, Bussey Institution	$3 00
Second, Hon. C. W. Hoitt	2 00
Gratuities: —	
W. N. Craig, Display	3 00
John Jeffries, "	2 00
John L. Gardner, "	2 00
Estate of Joseph S. Fay, "	2 00
G. A. Oliver, "	2 00
John Parker, "	1 00
Mrs. E. M. Gill, "	1 00
William C. Winter, "	1 00
H. A. Wheeler, "	1 00
Mrs. P. D. Richards, Native Plants	1 00
The Misses Doran, " "	1 00

EXHIBITION OF AQUATIC PLANTS AND FLOWERS.

AUGUST 21.

Theodore Lyman Fund.

AQUATICS. — General display of Nymphæas, Nelumbiums, Sedges, Papyrus, and other aquatic plants, arranged for effect, to include not less than twenty-five blooms of Nymphæas, Henry A. Dreer, Philadelphia	50 00
Second, Oakes Ames	30 00
Display of twelve Nymphæas and Nelumbiums, named, Oakes Ames,	10 00
ASTERS. — Large flowered of all classes, fifty vases, not less than twelve varieties, three flowers in each vase, Joseph H. White,	6 00
Second, John L. Gardner	5 00
Third, Charles H. Souther	4 00
Truffaut's Pæony Flowered, thirty blooms, not less than twelve varieties, Joseph H. White	5 00
Second, H. A. Wheeler	3 00
Victoria Flowered, thirty blooms, not less than twelve varieties, Joseph H. White	5 00
Second, John Jeffries	3 00
Pompon, twenty-four cut plants, not less than six varieties, John L. Gardner	5 00
HERBACEOUS PLANTS. — Thirty bottles, Nathaniel T. Kidder	8 00
Second, Jacob W. Manning	6 00
Third, Oakes Ames	4 00
Gratuities: —	
Botanic Garden of Harvard University, Herbaceous Plants	10 00
John L. Gardner, Asters	1 00
Henry A. Dreer, Philadelphia, Phlox	1 00

George Hollis, Display	$2 00
Henry A. Dreer, "	1 00
Rea Brothers, "	1 00
John L. Gardner, "	1 00
Mrs. E. M. Gill, "	1 00
Mrs. P. D. Richards, Native Plants	1 00
Miss Helen M. Noyes, " "	1 00

AUGUST 28.

Gratuity: —

Botanic Garden of Harvard University, Display	3 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 1 AND 2.

DAHLIAS. — Show, twelve blooms, distinct named varieties, John Parker	4 00
Second, Lothrop & Higgins	3 00
Third, H. F. Burt	2 00
Fancy, twelve blooms, distinct named varieties, H. F. Burt	4 00
Cactus, twelve blooms, distinct named varieties, L. W. Snow	4 00
Second, H. F. Burt	3 00
Third, H. F. Burt	2 00
Liliputian, twelve blooms, distinct named varieties, Lothrop & Higgins	4 00
Second, Lothrop & Higgins	3 00
Third, L. W. Snow	2 00
Single, twelve blooms, distinct named varieties, John Endicott & Co.	4 00
Second, John Endicott & Co.	3 00
General Display, all classes admissible, one hundred or more bottles, H. F. Burt	10 00
Second, William C. Winter	8 00
Third, Lothrop & Higgins	6 00
LILIUM LANCIFOLIUM. — Collection of named varieties, Sumner Coolidge	4 00
TROPÆOLUMS. — Display with their own foliage, filling twenty-five vases, Kenneth Finlayson	4 00
Second, James L. Little	3 00
Third, John Jeffries	2 00
MARIGOLDS. — Display of French and African, filling twenty-five vases, John L. Gardner	3 00
Second, James Comley	2 00
DOUBLE ZINNIAS. — Twenty-five flowers, not less than six varieties, E. Sheppard & Son	4 00
Second, Oakes Ames	3 00
Third, Kenneth Finlayson	2 00

NATIVE PLANTS. — Collection, not exceeding forty bottles of named species and varieties, Misses Eleanor and Mollie Doran	$8 00
Second, Mrs. P. D. Richards	6 00
Third, Miss Helen M. Noyes	4 00
VASE OF FLOWERS. — For table decoration, on the last day of the exhibition, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00
Third, Mrs. E. M. Gill	2 00
Gratuities: —	
Oakes Ames, Aquatics	10 00
L. W. Goodell, "	7 00
N. B. Shaw, Nymphæa Devoniensis	2 00
James L. Little, Begonias	2 00
C. E. Richardson, Tuberous Begonias	1 00
A. Lummus, Dahlias	1 00
James Comley, Display	4 00
L. W. Goodell, "	2 00
Mrs. E. M. Gill, "	2 00
Mrs. J. A. Cain, "	1 00

SEPTEMBER 11.

HERBACEOUS PLANTS. — Thirty bottles, Nathaniel T. Kidder	8 00
Second, Oakes Ames	6 00
Gratuities: —	
John Endicott & Co., Dahlias	1 00
James Comley, Display	3 00
Mrs. E. M. Gill, "	1 00
Miss Helen M. Noyes, Native Plants	1 00

SEPTEMBER 18.

PERENNIAL ASTERS. — Display of Native or Introduced species and varieties, Misses Eleanor and Mollie Doran	5 00
Second, Mrs. P. D. Richards	4 00
Third, John L. Gardner	3 00
ORNAMENTAL FRUITED HARDY TREES AND SHRUBS. — Collection of cut branches, named, Jackson Dawson	8 00
Second, Jackson Dawson	6 00
Gratuities: —	
Walter E. Coburn, *Aster Novæ Angliæ*	1 00
James Anderson, Display	2 00
Mrs. E. M. Gill "	2 00

SEPTEMBER 25.

Gratuity: —	
Mrs. E. M. Gill, Display	1 00

October 9.

Gratuities : —

H. A. Wheeler, Petunias $1 00
Mrs. E. M. Gill, Display 1 00
Misses Eleanor and Mollie Doran, Display of Native Plants . . 2 00

October 16.

Chrysanthemums. — Six blooms, distinct named varieties, James L. Little 3 00
Second, Cornelius Vanderbilt, Newport, R.I. 2 00
Third, J. W. Howard 1 00
Ten blooms of one variety, long stemmed, in vase, Cornelius Vanderbilt 8 00
Second, Cornelius Vanderbilt 6 00
Third, J. W. Howard 4 00

Gratuities : —

J. W. Leach & Sons, Chrysanthemum Ivory 1 00
C. E. Richardson, Tuberous Begonias 1 00
James Comley, Display 2 00
Mrs. E. M. Gill, " 1 00

October 23.

Gratuities : —

W. N. Craig, *Eucharis Amazonica* 2 00
" " " Chrysanthemums 1 00
H. A. Wheeler, " 1 00

October 30.

Gratuity : —

Oakes Ames, Orchids 5 00

CHRYSANTHEMUM SHOW.

November 2, 3, 4, and 5.

Special Prizes.

Josiah Bradlee Fund.

Chrysanthemums. — Twenty-five blooms of twenty-five distinct named varieties, E. M. Wood & Co. 20 00
Second, Cornelius Vanderbilt, Newport, R.I. 15 00
Third, Mrs. Benjamin P. Cheney 10 00
Six vases of six named varieties, ten blooms each, E. M. Wood & Co. 30 00
Second, Mrs. Benjamin P. Cheney 25 00
Third, J. W. Howard 20 00

Society's Prizes.

Twelve cut blooms, Incurved, named, Joseph H. White	$8 00
Second, Charles H. Souther	6 00
Twelve cut blooms, Japanese, named, David Nevins	10 00
Second, Joseph H. White	6 00
Third, Nathaniel T. Kidder	4 00
Twelve cut blooms, Japanese Incurved, named, E. M. Wood & Co.	10 00
Second, Joseph H. White	6 00
Third, Mrs. Benjamin P. Cheney	4 00
Twelve cut blooms, Anemone, named, James L. Little	8 00
Second, James L. Little	6 00
Six cut blooms, Incurved, named, Joseph H. White	5 00
Second, Charles H. Souther	4 00
Third, Elijah A. Wood	2 00
Six cut blooms, Japanese, named, Charles H. Souther	6 00
Second, James L. Little	4 00
Six cut blooms, Japanese Incurved, named, Charles H. Souther	6 00
Second, James L. Little	4 00
Six cut blooms, Reflexed, named, Joseph H. White	6 00
Second, Charles H. Souther	4 00
Third, E. S. Converse	2 00
Six cut blooms, Anemone, named, E. S. Converse	5 00
Second, James L. Little	4 00
Third, J. W. Howard	2 00
Twelve sprays Pompons, not less than six named varieties, the third prize to J. W. Howard	1 00
Twelve best varieties, named, introductions of 1897, Kenneth Finlayson	8 00
Second, Mrs. Benjamin P. Cheney	6 00
Vase of ten blooms on long stems, Pink, named, C. Vanderbilt, for Interocean	10 00
Second, H. McKay Twombly, for Viviand Morel	8 00
Third, David Nevins, for Viviand Morel	6 00
Vase of ten blooms on long stems, Red, named, David Nevins, for John Shrimpton	10 00
Second, E. M. Wood & Co., for Edwin Molyneux	8 00
Third, Mrs. Benjamin P. Cheney, for John Shrimpton	6 00
Vase of ten blooms on long stems, White, named, H. McKay Twombly, for Frank Hardy	10 00
Second, E. M. Wood & Co., for Mrs. Jerome Jones	8 00
Third, Mrs. Benjamin P. Cheney, for Mutual Friend	6 00
Vase of ten blooms on long stems, Yellow, named, David Nevins, for Major Bonnafon	10 00
Second, E. M. Wood & Co., for Golden Wedding	8 00
Third, Hon. John Simpkins, for Modesto	6 00

Vase of blooms on long stems, any other color, named, H. McKay Twombly, for Silver Cloud	$10 00
Second, David Nevins, for Charles Davis	8 00
Third, Mrs. Benjamin P. Cheney, for Mrs. George West	6 00
Vase of blooms on long stems, arranged in the Society's large China vases, to be kept in good condition during the exhibition, E. M. Wood & Co.	20 00
Second, Hon. John Simpkins	18 00
Third, Miss Eleanor J. Clark	16 00
Fourth, Charles H. Souther	14 00
Fifth, David Nevins	12 00
Sixth, W. N. Craig	10 00
Seventh, J. W. Howard	8 00
Best Seedling, never disseminated, Yellow, six blooms, C. Vanderbilt, Newport, R.I., for Peter Kay	5 00
Best Seedling, never disseminated, Incurved, of any color, six blooms, Joseph H. White, for Mrs. Gertrude Brydon	5 00

Gratuities : —

Frank Jones, Display of Chrysanthemums	6 00
Mrs. E. M. Gill, Chrysanthemums	3 00
William Nicholson, Carnations and Chrysanthemums	4 00
Peter Fisher, Carnations	1 00
James Comley, Display	3 00

NOVEMBER 13.

Gratuity : —

Mrs. E. M. Gill, Chrysanthemums	1 00

SOCIETY'S SILVER MEDALS.

Spring Exhibition, March 23. James Comley, for a new variety of Japanese Flowering Cherry.

May 22. Carl Jurgens, Newport, R.I., for *Convallaria prolificans.*

Rhododendron Show, June 3. James Comley, for new hardy Rhododendron James Comley.

Rose Exhibition, June 22. M. H. Walsh, for Rose Lilian Nordica.

August 21. Henry A. Dreer, Philadelphia, for a Collection of new Cannas.

Chrysanthemum Show, November 2. J. J. Van Alen, for Hybrid *Begonia semperflorens.*

APPLETON GOLD MEDAL.

Rhododendron Show, June 3. Hon. C. G. Roebling, Trenton, N.J., for a Collection of Orchids.

APPLETON SILVER MEDAL.

December 31. N. T. Kidder, he having taken the greatest number of First Prizes for Hardy Herbaceous Perennials through the season.

" 31. Mrs. P. D. Richards, she having taken the greatest number of First Prizes for Native Plants through the season.

APPLETON BRONZE MEDAL.

December 31. Jacob W. Manning, he having taken the second greatest number of First Prizes for Hardy Herbaceous Perennials through the season.

" 31. Misses Eleanor and Mollie Doran, they having taken the second greatest number of First Prizes for Native Plants through the season.

KELWAY SILVER GILT MEDAL.

June 19. Kenneth Finlayson, for the best Collection of eighteen named varieties of *Pæonia albiflora*, single or double.

KELWAY BRONZE MEDAL.

June 19. T. C. Thurlow, for the second best Collection of eighteen named varieties of *Pæonia albiflora*, single or double.

FIRST CLASS CERTIFICATES OF MERIT.

January 23. H. A. Cook, for Carnation Nivea.

February 13. John N. May, Summit, N.J., for Carnation Lily Dean.

" 20. Jacob W. Manning, for *Hemerocallis aurantiaca major*.

April 24. F. A. Blake, Rochdale, for Seedling Carnation Bon Ton.

May 22. Miellez Horticultural Company, for Lily of the Valley.

Rhododendron Show, June 3. Hon. C. G. Roebling, Trenton, N.J., for Lælio-Cattleya C. G. Roebling.

" " " " W. A. Manda, South Orange, N.J., for *Lælia purpurata* var. *South Orangiensis*.

" " " " " " for *Lilium longiflorum foliis alba marginata*.

Pæony Exhibition, June 19. George Hollis, for Seedling Pæony George Washington.

Rose Exhibition, June 22. W. A. Manda, South Orange, N.J., for new Rose, a cross between Rosa Wichuraiana and Perle des Jardins.

" " " " " for new Rose, a cross between Rosa Wichuraiana and Madame Hoste.

" " " M. H. Walsh, for Rose Joseph S. Fay.

July 3. T. C. Thurlow, for *Rhus cotinus atropurpureus*.

" " W. H. Cowing, for *Rosa lucida alba*.

" 24. James L. Little, for *Begonia Haageana*.

" " Harvard Botanic Garden, for *Podophyllum Emodi*.

August 21. Henry A. Dreer, Philadelphia, for *Nymphæa Falconerii*.

" " " " " " for Canna Allemania.

" " " " " " for Gladiolus White Lady.

September 11. Robert Cameron, for *Aster Novæ Angliæ.*
October 30. I. E. Coburn, for a Collection of Pansies.
Chrysanthemum Show, November 2. Peter Fisher, for Carnation Mrs. T. W. Lawson.
" " " " Hugh Graham, Philadelphia, for Chrysanthemum Pennsylvania.

HONORABLE MENTION.

January 16. Hugh Graham, Philadelphia, for new Carnation Victor.
April 10. F. A. Blake, for new scarlet Seedling Carnation Bon Ton.
June 3. James Comley, for new hardy Rhododendron William Power Wilson.
" 22. W. A. Manda, South Orange, N.J., for *Lælia elegans Mandiana.*
July 10. John L. Gardner, for new Seedling Delphinium.
" 31. " " " for new Seedling Delphinium.
August 21. Henry A. Dreer, Philadelphia, for Double and Fringed Petunias.
" " George Hollis, for a sport of *Vallota purpurea.*
September 11. Cornelius Vanderbilt, Newport, R.I., for Fringed Tuberous Begonias.
Chrysanthemum Show, November 2. Joseph Hilbert, Nyack, N.Y., for a sport of Swainsonia.
" " " " A. Roper, for Carnation Mayor Quincy.

COMPLIMENTARY NOTICE.

February 6. A. Roper, for new Carnation Roper's Seedling.

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1897.

By E. W. WOOD, Chairman.

The fruit crop of the present year, as indicated by our exhibitions, was below the average of the last few years. While there was no absolute failure in any particular line of fruit, the natural conditions were unfavorable for the best results. There was less injury to the peach buds and to the strawberry, raspberry, and blackberry plants than usual, but the excessive amount of moisture and the limited amount of sunshine were unfavorable to the growth and maturity of the small fruits.

It being the off year for apples, the quantity shown and the quality of the exhibits compared unfavorably with the preceding year. The constant repetition of a biennial apple crop suggests the effort to change the bearing year of a portion of the orchard, especially of the late varieties, which may be done by removing the blossoms for two or three successive bearing years on young or newly grafted trees.

Seldom, if ever, has the pear crop been more abundant, and except when carefully thinned the fruit was inferior in size and quality. There was a large quantity of pears shown at the Annual Exhibition, and while there were comparatively few specimens deserving special mention, there were fewer than usual that did not do credit to the growers and the Exhibition.

Peaches were shown in larger quantity than for several years. Some exhibits were of superior quality, while others showed unmistakable signs of being the product of diseased trees.

Plums were fairly represented. The increase in the number and quantity of Japanese varieties was especially noticeable, and they will doubtless prove a valuable addition to the list of plums heretofore under cultivation.

At the Strawberry Exhibition all popular varieties were well represented. The Marshall, as in previous years, won all the prizes where it was in competition. There has been complaint from some of the commercial growers that it has not proved sufficiently productive, while others have found it the most profitable variety they have grown. Whatever may be the final consensus of opinion as to its value as a field berry, there can be no question as to its superiority for the amateur and for exhibition. Several new seedlings were shown requiring further cultivation to establish their standing. Of recent introductions the Clyde seems to be the most popular variety. The fruit is of medium size and fair quality; the plant is a strong grower, and, as far as tested, proves remarkably productive. It will be placed on the premium list for 1898.

A pleasing and encouraging feature of our exhibitions has been the steady but constant improvement of the fruit placed on exhibition. The exhibitors are more careful in the selection and arrangement of their specimens, and where the competition is between single dishes of the same varieties there is little encouragement to compete with inferior or imperfect specimens.

Campbell's Early Grape was shown at three exhibitions, and the specimens were an improvement in appearance and quality over those exhibited last year. There were seedling apples, pears, and grapes from other States shown during the season, but the Committee could not, after careful examination, discover any single point of excellence over similar fruits already in general cultivation.

Most of our new fruits have been chance seedlings. The fruit growers have hardly kept pace with the florists in improvement by cross-fertilization, as note the improvement in the rose, chrysanthemum, and carnation within the last ten years. Cross-breeding of animals shows what may be accomplished by intelligent and persevering effort and the selection of parents with a definite object in view. Fruits and flowers seem equally susceptible of improvement by cross-fertilization.

The Committee have awarded in prizes and gratuities $1,604, leaving an unexpended balance of $196.

E. W. Wood,
O. B. Hadwen,
Samuel Hartwell,
Warren Fenno,
} *Committee.*

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

1897.

SPRING EXHIBITION.

March 23, 24, 25, and 26.

Winter Apples. — Baldwin, J. V. Fletcher	$3 00
Second, John W. Clark	2 00
Third, Charles W. Boyden	1 00
Northern Spy, F. J. Boyden	3 00
Second, George V. Fletcher	2 00
Third, George C. Rice	1 00
Roxbury Russet, H. R. Kinney	3 00
Second, George V. Fletcher	2 00
Third, Charles C. Boyden	1 00
Tompkins King, George C. Rice	3 00
Second, F. J. Kinney	2 00
Third, Charles C. Boyden	1 00
Any other variety, George C. Rice, Yellow Bellflower	3 00
Second, George C. Rice, Palmer	2 00
Third, George V. Fletcher, Rhode Island Greening	1 00
Strawberries. — One pint, E. S. Converse	3 00

Gratuity : —

Jackson Dawson, Strawberry plants in fruit	2 00

May 29.

Gratuity : —

William Brown, Hothouse peaches	2 00

RHODODENDRON SHOW.

June 3 and 4.

Gratuity : —

E. S. Converse, Nectarines	1 00

June 12.

Gratuities : —

Hon. Joseph S. Fay, Strawberries	2 00
W. N. Craig, "	1 00
William Doran & Son, "	1 00

June 19.

Gratuity : —

Estate of Joseph S. Fay, Strawberries	2 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prizes from the Theodore Lyman Fund.

STRAWBERRIES. — Four quarts of any variety, Varnum Frost, Marshall	$20 00
Second, George E. Horne, Marshall	16 00
Third, Estate of Joseph S. Fay, Marshall	12 00
Fourth, Warren Heustis & Son, "	10 00
Fifth, George V. Fletcher, "	8 00

Special Prizes offered by the Society.

Two quarts of any variety, best adapted for garden cultivation, for home use, to be judged by points, Estate of Joseph S. Fay, Marshall	6 00
Second, Warren Heustis & Son, Marshall	5 00
Third, Isaac E. Coburn, Jessie	4 00
Fourth, George V. Fletcher, Marshall	3 00

Regular Prizes.

For the largest and best collection, not less than twenty baskets of two quarts each, and not less than five varieties, George F. Wheeler	25 00
Second, I. E. Coburn	20 00
Ten baskets of two quarts each, not less than three varieties, George F. Wheeler	15 00
Second, I. E. Coburn	12 00
Five baskets, two quarts each, of one variety, George E. Horne	8 00
Two quarts of Belmont, George V. Fletcher	4 00
Second, Varnum Frost	3 00
Bubach, George E. Horne	4 00
Second, I. E. Coburn	3 00
Third, George V. Fletcher	2 00
Champion, George E. Horne	4 00
Charles Downing, Miss Mary S. Walker	4 00
Second, George F. Wheeler	3 00
Third, William Doran & Son	2 00
Crescent, George F. Wheeler	4 00
Second, I. E. Coburn	3 00
Third, Rev. C. Terry	2 00
Haverland, I. E. Coburn	4 00
Second, John C. Haskell	3 00
Third, George F. Wheeler	2 00
Hersey, George F. Wheeler	4 00
Jessie, George V. Fletcher	4 00
Second, I. E. Coburn	3 00
Third, George F. Wheeler	2 00

Leader, William Doran & Son	$4 00
Second, George F. Wheeler	3 00
Third, E. S. Converse	2 00
Marshall, Varnum Frost	4 00
Second, Estate of Joseph S. Fay	3 00
Third, George E. Horne	2 00
Miner's Prolific, Charles S. Smith	4 00
Second, George F. Wheeler	3 00
Parker Earle, I. E. Coburn	4 00
Second, George F. Wheeler	3 00
Sharpless, George E. Horne	4 00
Second, William Doran & Son	3 00
Timbrell, the second prize to William Doran & Son	3 00
Any other variety, George F. Wheeler, Enormous	4 00
Second, S. H. Warren, Clyde	3 00
Third, I. E. Coburn, Beverly	2 00
Collection, not less than six varieties, one quart each, I..E. Coburn,	8 00
Second, George F. Wheeler	6 00
One quart of any new variety, not previously exhibited, S. H. Warren, Seedling No. 3	5 00
Second, George E. Horne, Seedling	4 00
Cherries. — Two quarts of any variety, O. R. Robbins	4 00
Second, George V. Fletcher	3 00
Third, Edwin Hastings	2 00
Foreign Grapes. — Two bunches of any variety, Joseph H. White	6 00
Second, William C. Winter	4 00
Forced Peaches. — Six of any variety, A. Packard	3 00
Second, William C. Winter	2 00
Gratuity : —	
Edmund Hersey, Cranberries	1 00

June 26.

Strawberries. — Two quarts of any variety, Warren Heustis & Son	4 00
Second, Estate of Joseph S. Fay	3 00
Third, E. L. Smith	2 00
Gratuity : —	
Thomas Harrison, Cherries	1 00

July 3.

Cherries. — Two quarts of Black Eagle, E. S. Converse	3 00
Second, Frederick W. Damon	2 00
Third, A. F. Coolidge	1 00
Black Tartarian, George V. Fletcher	3 00
Second, Charles B. Travis	2 00
Third, Edwin Hastings	1 00

Coe's Transparent, John L. Bird $3 00
Downer, M. W. Chadbourne 3 00
Any other variety, Charles B. Travis, Elton 3 00
Second, Charles S. Smith, Governor Wood 2 00
Third, George V. Fletcher 1 00

Gratuities: —

Warren Heustis & Son, Strawberries 1 00
William C. Winter, Foreign Grapes 2 00
E. S. Converse, Peaches 1 00
William Doran & Son, Collection 2 00

JULY 10.

RASPBERRIES. — Two quarts of any variety, Benjamin G. Smith . 3 00
Second, Frederick W. Damon 2 00
CURRANTS. — Two quarts of any Red variety, W. N. Craig, Fay's . 4 00
Second, Sumner Coolidge, Fay's 3 00
Third, William Doran & Son, Versaillaise 2 00
Fourth, W. N. Craig, Versaillaise 1 00
Two quarts of any White variety, Frederick W. Damon . . 3 00
Second, Mrs. Arthur W. Blake 2 00
Third, E. S. Converse 1 00
GOOSEBERRIES. — Two quarts of any variety of American origin, Joseph S. Chase, Triumph 4 00
Second, W. N. Craig, Columbus 3 00
Third, W. G. Kendall, Chatauqua 2 00
Fourth, Starkes Whiton, Bates's Seedling 1 00

Gratuities: —

Warren Heustis & Son, Marshall Strawberries 1 00
M. W. Chadbourne, Cherries 1 00
E. S. Chapell, " 1 00

JULY 17.

RASPBERRIES. — Two quarts of any variety, Benjamin G. Smith . 3 00
Second, William Doran & Son, Franconia 2 00
Third, William Doran & Son, Antwerp 1 00
CURRANTS. — One quart of any Red variety, W. N. Craig, Versaillaise 3 00
Second, Sumner Coolidge 2 00
Third, W. N. Craig, Fay's 1 00
One quart of any White variety, Francis Blake, White Grape . 2 00
Second, George V. Fletcher, White Grape 1 00
GOOSEBERRIES. — Two quarts of any Foreign variety, Benjamin G. Smith, Hero of the Nile 4 00
Second, Benjamin G. Smith, Green Ocean 3 00
Third, Benjamin G. Smith, Ashton 2 00
Fourth, W. N. Craig, Industry 1 00

Gratuities : —

Charles S. Smith, Cherries $1 00
Vera Chapell, " 1 00
A. H. Griesa, Lawrence, Kansas, for Superb Apricot, a First Class Certificate of Merit.

JULY 24.

BLACKBERRIES. — Two quarts of any variety, M. W. Chadbourne . 3 00
Second, Nathaniel T. Kidder 2 00
APPLES. — Tetofsky, Sumner Coolidge 3 00
Second, M. W. Chadbourne 2 00
Third, Samuel Hartwell 1 00
PEARS. — Summer Doyenne, E. S. Converse 3 00
Second, Leverett M. Chase 2 00
Third, Warren Fenno 1 00
PEACHES. — Six of any variety, William C. Winter . . . 3 00
Second, W. D. Hinds 2 00

Gratuities : —

P. Murray Winter, Seedling Gooseberry 1 00
James L. Little, Seedling Gooseberries 1 00
W. D. Hinds, Collection of Raspberries 1 00

JULY 31.

APPLES. — Red Astrachan, Frederick W. Damon 3 00
Second, William C. Winter 2 00
Third, Warren Fenno 1 00
Sweet Bough, George V. Fletcher 3 00
Second, Charles B. Travis 2 00
Third, Warren Fenno 1 00
Any other variety, Sumner Coolidge, Williams's Favorite . . 3 00
Second, Joshua C. Stone 2 00
PEARS. — Giffard, Rufus T. Tobey 3 00
Second, Mrs. Emmons 2 00
Third, A. T. Brown 1 00
Any other variety, Mrs. S. Klaus, Clapp's Favorite . . . 3 00
Second, A. T. Brown " " 2 00
Third, Sumner Coolidge " " 1 00
BLACKBERRIES. — Two quarts of any variety, Sumner Coolidge . 3 00
Second, M. W. Chadbourne 2 00
Third, Francis Blake 1 00
PEACHES. — Outdoor culture, any variety, William G. Prescott . 3 00
Second, Francis Blake 2 00
Third, N. D. Harrington 1 00

August 7.

Apples. — Oldenburg, J. V. Fletcher $3 00
Any other variety, Frederick W. Damon, Red Astrachan . . 3 00
Second, Warren Fenno, Red Astrachan 2 00
Third, George V. Fletcher, Sweet Bough 1 00
Pears. — Clapp's Favorite, Mrs. S. Klaus 3 00
Second, Sumner Coolidge 2 00
Third, A. T. Brown 1 00
Any other variety, Frederick W. Damon 2 00
Second, Warren Fenno 1 00
Peaches. — Twelve specimens of outdoor culture, any variety, George H. Sherwin, Hale's Early 3 00
Second, Charles F. Curtis, Hale's Early 2 00
Third, Francis Blake, Amsden 1 00
Six specimens, cold house or pot culture, William C. Winter . 3 00
Plums. — Japanese, any variety, T. A. Greenleaf, Abundance . 3 00
Second, W. D. Hinds, Burbank 2 00
Third, W. D. Hinds, Abundance 1 00
Foreign Grapes. — Two bunches of any variety, Miss Eleanor J. Clark, Pomfret, Conn., Black Hamburg 5 00
Second, E. S. Converse, Syrian 4 00

August 14.

Apples. — Summer Pippin, Samuel Hartwell 3 00
Second, Warren Fenno 2 00
Williams's Favorite, Joshua C. Stone 3 00
Second, Charles F. Curtis 2 00
Third, Sumner Coolidge 1 00
Any other variety, H. F. Tuttle, Red Astrachan 3 00
Second, Samuel Hartwell, Gravenstein 2 00
Third, Samuel Hartwell, Bietigheimer 1 00
Pears. — Rostiezer, M. W. Chadbourne 3 00
Second, S. F. & F. L. Weston 2 00
Third, A. T. Brown 1 00
Tyson, Leverett M. Chase 3 00
Second, John L. Bird 2 00
Third, Clifford R. Weld 1 00
Any other variety, Sumner Coolidge, Clapp's Favorite . . 3 00
Second, Mrs. S. Klaus, " " . . . 2 00
Third, A. T. Brown, " " . . . 1 00
Peaches. — Any variety, Sumner Coolidge, Early Rivers . . 3 00
Second, E. S. Converse, Royal George 2 00
Third, H. F. Tuttle, Early Rivers 1 00
Plums. — Japanese, any variety, William C. Winter, Abundance . 3 00
Second, W. D. Hinds, Abundance 2 00
Third, W. D. Hinds, Burbank 1 00

Gratuities: —

Joseph S. Chase, Collection of Japanese Plums $1 00
William C. Winter, Cold House Peaches 1 00

AUGUST 21.

APPLES. — Foundling, the second prize to Warren Fenno . . 2 00
Gravenstein, Samuel Hartwell 3 00
Second, Warren Heustis & Son 2 00
Third, W. D. Hinds 1 00
Maiden's Blush, Warren Fenno 3 00
Second, William C. Winter 2 00
Third, Joshua C. Stone 1 00
Porter, M. W. Chadbourne 3 00
Second, Joshua C. Stone 2 00
Third, Samuel Hartwell 1 00
Any other variety, Joshua C. Stone, Williams's Favorite . . 3 00
Second, Samuel Hartwell, Summer Pippin 2 00
Third, W. D. Hinds, Williams's Favorite 1 00
PEARS. — Andrews, E. S. Converse 3 00
Second, Joshua C. Stone 2 00
Bartlett, William Milman 3 00
Second, Mrs. S. Klaus 2 00
Third, A. T. Brown 1 00
Souvenir du Congrès, A. T. Brown 3 00
Second, Warren Fenno 2 00
Third, M. W. Chadbourne 1 00
Any other variety, Mrs. S. Klaus 3 00
Second, J. L. Duncan 2 00
Third, A. T. Brown 1 00
PEACHES. — Collection, the third prize to W. D. Hinds . . . 2 00
Single dish of any variety, Sumner Coolidge 3 00
Second, Francis Blake 2 00
Third, T. A. Greenleaf 1 00
PLUMS. — Bradshaw, George V. Fletcher 3 00
Second, William H. Hunt 2 00
Any other variety, Sumner Coolidge, Abundance . . . 3 00
Second, T. A. Greenleaf, " 2 00
Third, W. D. Hinds, " 1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 1 AND 2.

FOREIGN GRAPES. — Two bunches of Black Alicante, Miss Eleanor J. Clark, Pomfret, Conn. 5 00
Black Hamburg, Miss E. J. Clark 5 00
Second, E. S. Converse 4 00

Golden Hamburg, Miss E. J. Clark	$5 00
Lady Downes, the second prize to E. S. Converse	4 00
Muscat of Alexandria, Joseph H. White	5 00
Second, E. S. Converse	4 00
Any other variety, E. S. Converse, Blue Chasselas	5 00
Second, William C. Winter, Frontignan	4 00
Third, E. S. Converse, Red Chasselas	3 00

SEPTEMBER 4.

Gratuity : —

C. R. Safford, Crawford's Early Peaches	1 00

SEPTEMBER 11.

APPLES. — Gravenstein, Samuel Hartwell	3 00
Second, C. L. Hartshorn	2 00
Third, Charles S. Smith	1 00
Maiden's Blush, W. G. Kendall	3 00
Second, Warren Fenno	2 00
Third, H. R. Kinney	1 00
Porter, M. W. Chadbourne	3 00
Second, Frederick W. Damon	2 00
Third, Joshua C. Stone	1 00
Pumpkin Sweet, Samuel Hartwell	3 00
Any other variety, Warren Fenno, Washington Strawberry	3 00
Second, Joshua C. Stone, " "	2 00
Third, Warren Fenno, Twenty Ounce	1 00
CRAB APPLES. — Twenty-four specimens of Transcendent, Warren Fenno	2 00
Any other variety, M. W. Chadbourne, Hyslop	2 00
Second, Joshua C. Stone, Hyslop	1 00
PEARS. — Bartlett, William Milman	3 00
Second, Sumner Coolidge	2 00
Third, Mrs. S. Klaus	1 00
Belle Lucrative, Charles E. Richardson	3 00
Second, E. S. Converse	2 00
Third, A. T. Brown	1 00
Boussock, Sumner Coolidge	3 00
Second, W. H. Chipman	2 00
Third, M. W. Chadbourne	1 00
Hardy, Warren Fenno	3 00
Second, Mrs. E. M. Gill	2 00
Third, Rufus T. Tobey	1 00
Paradise of Autumn, William Milman	3 00
Second, Leverett M. Chase	2 00
Third, Warren Fenno	1 00

Any other variety, Charles E. Swain, Bosc	$3 00
Second, Mrs. S. Klaus, Seckel	2 00
Third, Warren Fenno, Souvenir du Congrès	1 00
PEACHES. — Coolidge's Favorite, Sumner Coolidge	3 00
Second, Charles S. Smith	2 00
Third, Samuel Hartwell	1 00
Crawford's Early, N. D. Harrington	3 00
Second, Francis Blake	2 00
Third, F. W. Mendum	1 00
Crosby, W. D. Hinds	3 00
Second, T. A. Greenleaf	2 00
Foster, Charles F. Curtis	3 00
Second, Bowman Kenrick	2 00
Third, C. R. Safford	1 00
Oldmixon Freestone, Sumner Coolidge	3 00
Second, Bowman Kenrick	2 00
Third, Elliott Moore	1 00
Stump the World, Leverett M. Chase	3 00
Second, Louville Curtis	2 00
Third, T. A. Greenleaf	1 00
Any other variety, T. A. Greenleaf, Mountain Rose	3 00
Second, Benjamin G. Smith, Champion	2 00
Third, Rufus T. Tobey, Mountain Rose	1 00
PEACHES, ORCHARD HOUSE CULTURE. — Any variety, Miss Alice Carey	4 00
Second, Joseph H. White	3 00
NECTARINES, OUTDOOR CULTURE. — Any variety, C. C. Donnell	4 00
Second, Francis Blake	3 00
PLUMS. — Imperial Gage, George V. Fletcher	3 00
Second, William H. Hunt	2 00
Lombard, John L. Bird	3 00
Second, Mrs. S. Klaus	2 00
Third, Leverett M. Chase	1 00
Washington, Charles F. Curtis	3 00
Any other variety, Mrs. Mary T. Goddard, Pond's Seedling	3 00
Second, George V. Fletcher, Bradshaw	2 00
Third, William C. Winter, Yellow Egg	1 00
Japanese Plums, any variety, T. A. Greenleaf, Satsuma	3 00
Second, W. D. Hinds, Burbank	2 00
NATIVE GRAPES. — Six bunches of Eumelan, Benjamin G. Smith	3 00
Second, Frederick W. Damon	2 00
Massasoit, Joseph S. Chase	3 00
Second, F. J. Kinney	2 00
Moore's Early, Frederick W. Damon	3 00
Second, C. R. Robbins	2 00
Third, F. J. Kinney	1 00

Any other variety, George W. Campbell, Delaware, Ohio, Campbell's Early	$3 00
Second, Benjamin G. Smith, Wilder	2 00
Third, H. R. Kinney, Green Mountain	1 00
Any variety from girdled vines, F. J. Kinney, Worden	3 00
Second, F. J. Kinney, Moore's Early	2 00
Third, H. R. Kinney, Agawam	1 00
Figs. — Any variety, the second prize to William McRoberts	1 00

September 18.

Gratuities : —

Horace Eaton, Peaches	1 00
William Everett, Souvenir du Congrès Pears	1 00

September 25.

Gratuity : —

Warren Heustis & Son, Seedling Peaches	1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

September 30 and October 1.

Special Prizes from the Samuel Appleton Fund.

Apples. — Baldwin, Joshua C. Stone	5 00
Hubbardston, M. W. Chadbourne	5 00
Pears. — Bosc, Sumner Coolidge	5 00
Sheldon, Frederick W. Damon	5 00

Benjamin V. French Fund.

Apples. — Gravenstein, C. L. Hartshorn	5 00
Rhode Island Greening, C. L. Hartshorn	5 00

Marshall P. Wilder Fund.

Pears. — Anjou, William Milman	4 00
Second, Mrs. S. Klaus	3 00
Third, George V. Fletcher	2 00
Fourth, Sumner Coolidge	1 00
Bartlett, A. T. Brown	4 00
Second, George V. Fletcher	3 00
Third, William Milman	2 00
Fourth, Leverett M. Chase	1 00
Native Grapes. — Twelve bunches of Concord, H. R. Kinney	4 00
Second, George W. Jameson	3 00
Third, F. J. Kinney	2 00
Twelve bunches of Worden, F. J. Kinney	4 00
Second, Samuel Hartwell	3 00
Third, H. R. Kinney	2 00

Regular Prizes, Theodore Lyman Fund.

Apples. — Baldwin, Sumner Coolidge	$4 00
Second, Mrs. Mary T. Goddard	3 00
Third, Joshua C. Stone	2 00
Dutch Codlin, Warren Fenno	3 00
Second, Sumner Coolidge	2 00
Holden, the second prize to H. R. Kinney	2 00
Third, Charles S. Smith	1 00
Fameuse, H. Whittaker	3 00
Second, Sumner Coolidge	2 00
Third, M. W. Chadbourne	1 00
Fletcher Russet, John Fletcher	3 00
Second, William H. Teele	2 00
Third, Charles F. Curtis	1 00
Gloria Mundi, Samuel Hartwell	3 00
Golden Russet, Henry E. Rich	2 00
Second, Mrs. Mary T. Goddard	1 00
Gravenstein, Benjamin M. Smith	4 00
Second, C. L. Hartshorn	3 00
Third, Charles S. Smith	2 00
Hubbardston, Mrs. Rose Buxton	4 00
Second, John Parker	3 00
Third, Samuel Hartwell	2 00
Hunt Russet, Samuel Hartwell	3 00
Second, William H. Teele	2 00
Third, S. P. Buxton	1 00
Mackintosh, F. J. Kinney	4 00
Second, George C. Rice	3 00
Third, C. M. Handley	2 00
Maiden's Blush, Warren Fenno	2 00
Northern Spy, William S. Janvrin	3 00
Second, Henry E. Rich	2 00
Third, George V. Fletcher	1 00
Porter, the second prize to George V. Fletcher	2 00
Third, Frederick W. Damon	1 00
Pound Sweet, George V. Fletcher	3 00
Second, Samuel Hartwell	2 00
Rhode Island Greening, C. L. Hartshorn	4 00
Second, A. H. Newton	3 00
Third, Henry E. Rich	2 00
Roxbury Russet, Jacob A. Leonard	4 00
Second, Sumner Coolidge	3 00
Third, Warren Fenno	2 00
Sutton, C. L. Hartshorn	3 00
Second, Henry E. Rich	2 00
Tolman's Sweet, Jacob A. Leonard	3 00

Tompkins King, George C. Rice	$3 00
Second, E. L. Conant	2 00
Third, F. J. Kinney	1 00
Any other variety, F. J. Kinney, Washington Strawberry	3 00
Second, George C. Rice, Fallawater	2 00
Third, George C. Rice, Yellow Bellflower	1 00
Crab Apples. — Hyslop, twenty-four specimens, J. L. Richardson,	2 00
Second, C. L. Hartshorn	1 00
Edible Nuts. — Collection, named, Parry's Pomona Nurseries, Parry, N.J.	10 00

Special Prizes offered by the Society.

Pears. — Anjou, A. K. Gould	5 00
Seckel, Joshua C. Stone	5 00
Peaches. — Any variety, Francis Blake	5 00
Native Grapes. — Any variety, Mount Vernon Nursery	5 00

Society's Regular Prizes.

Pears. — Angouleme, W. S. Janvrin	4 00
Second, A. T. Brown	3 00
Third, Mrs. Emmons	2 00
Fourth, Frederick W. Damon	1 00
Bosc, E. S. Converse	4 00
Second, Orlendo W. Dimick	3 00
Third, A. T. Brown	2 00
Fourth, Mary E. Walker	1 00
Clairgeau, W. S. Janvrin	3 00
Second, Warren Fenno	2 00
Third, Sumner Coolidge	1 00
Comice, A. T. Brown	3 00
Second, Mrs. Emmons	2 00
Third, Frederick W. Damon	1 00
Dana's Hovey, A. T. Brown	4 00
Second, Frederick W. Damon	3 00
Third, E. W. Wood	2 00
Fourth, George V. Fletcher	1 00
Diel, A. T. Brown	3 00
Second, Joshua C. Stone	2 00
Third, Mrs. Emmons	1 00
Fulton, E. S. Converse	3 00
Second, S. F. & F. L. Weston	2 00
Third, John Ward	1 00
Hardy, Charles F. Curtis	3 00
Second, William Milman	2 00
Third, Rufus T. Tobey	1 00
Howell, Warren Fenno	3 00
Second, A. K. Gould	2 00
Third, S. F. & F. L. Weston	1 00

Josephine of Malines, Warren Fenno	$3 00
Lawrence, W. S. Janvrin	3 00
Second, A. T. Brown	2 00
Third, Charles E. Swain	1 00
Louise Bonne of Jersey, Francis Blake	3 00
Second, A. T. Brown	2 00
Third, Charles E. Richardson	1 00
Marie Louise, Charles E. Swain	3 00
Second, Warren Fenno	2 00
Third, Mrs. Jones	1 00
Merriam, A. T. Brown	3 00
Second, Frederick W. Damon	2 00
Third, Warren Heustis & Son	1 00
Seckel, David Perkins	4 00
Second, N. D. Harrington	3 00
Third, Mrs. J. W. Porter	2 00
Fourth, Mrs. S. Klaus	1 00
Sheldon, N. D. Harrington	4 00
Second, A. T. Brown	3 00
Third, Frederick W. Damon	2 00
Fourth, Sumner Coolidge	1 00
St. Michael Archangel, T. M. Davis	3 00
Second, Warren Fenno	2 00
Third, Warren Heustis & Son	1 00
Superfin, Warren Fenno	3 00
Second, Sumner Coolidge	2 00
Third, Clifford R. Weld	1 00
Urbaniste, Mrs. Emmons	3 00
Second, A. T. Brown	2 00
Third, E. S. Converse	1 00
Vicar, A. T. Brown	3 00
Second, Mrs. Jones	2 00
Third, E. S. Converse	1 00
Winter Nelis, Mrs. Emmons	3 00
Second, A. T. Brown	2 00
Third, Clifford R. Weld	1 00
Any other variety, Warren Fenno, Pratt	3 00
Second, Rufus T. Tobey, Mount Vernon	2 00
Third, Henry Y. Gilson, Flemish Beauty	1 00
Quinces. — Champion, Orlendo W. Dimick	3 00
Second, George V. Fletcher	2 00
Third, Charles S. Smith	1 00
Orange, Arthur F. Coolidge	3 00
Second, J. L. Richardson	2 00
Third, Joshua C. Stone	1 00
Pear, Benjamin G. Smith	3 00
Second, George L. Brown	2 00
Third, George V. Fletcher	1 00

Rea, Warren Fenno	$3 00
Peaches. — Crawford's Late, E. M. Bruce	3 00
Second, Francis Blake	2 00
Third, H. R. Kinney	1 00
Any other variety, Benjamin M. Smith, Elberta	3 00
Second, N. D. Harrington, Seedling	2 00
Third, Charles E. Swain, Oldmixon	1 00
Peaches, Orchard House Culture. — Any variety, Robert McLeod, Newport, R.I.	4 00
Second, Robert McLeod	3 00
Plums. — Coe's Golden Drop, A. K. Gould	2 00
Second, William C. Winter	1 00
Yellow Egg, George V. Fletcher	2 00
Any other variety, P. G. Hanson, Jefferson	2 00
Second, Sumner Coolidge	1 00
Native Grapes. — Six bunches of Brighton, Thomas H. Talbot	3 00
Second, Mount Vernon Nursery	2 00
Third, Samuel Hartwell	1 00
Delaware, Mount Vernon Nursery	3 00
Second, Frederick W. Damon	2 00
Third, Warren Fenno	1 00
Herbert, Benjamin G. Smith	3 00
Second, Mount Vernon Nursery	2 00
Iona, Mount Vernon Nursery	3 00
Second, Frederick W. Damon	2 00
Third, Benjamin G. Smith	1 00
Lindley, Benjamin G. Smith	3 00
Third, Frederick W. Damon	1 00
Niagara, E. S. Converse	3 00
Second, George A. Wills	2 00
Third, Benjamin G. Smith	1 00
Pocklington, Frederick W. Damon	3 00
Second, P. G. Hanson	2 00
Third, S. F. & F. L. Weston	1 00
Prentiss, Mount Vernon Nursery	3 00
Second, Benjamin G. Smith	2 00
Wilder, Benjamin G. Smith	3 00
Second, Frederick W. Damon	2 00
Third, F. J. Kinney	1 00
Any other variety, Mount Vernon Nursery, Vergennes	3 00
Second, Frederick W. Damon, Moore's Early	2 00
Third, Frederick W. Damon, Diamond	1 00
Concord, from girdled vines, H. R. Kinney	3 00
Second, F. J. Kinney	2 00
Foreign Grapes. — Two bunches of any variety, E. S. Converse, Chasselas	5 00
Second, E. S. Converse, Black Alicante	4 00

Cranberries. — Half peck, L. J. Fosdick, Gloriana	$3 00
Second, L. J. Fosdick, McFarlin	2 00
Third, L. J. Fosdick, Early Black	1 00
Gratuities : —	
James Comley, Collection	3 00
Mrs. E. M. Gill, "	1 00
Robert Manning, Figs	1 00
Ellwanger & Barry, Collection of Pears and Quinces, Appleton Silver Medal.	

October 16.

Gratuities : —	
Elbridge Torrey, Sheldon Pears	1 00
William C. Clapp, " "	1 00
John L. Gardner, Seckel Pears	1 00
S. S. Crosby, Quinces	1 00
Frederick W. Damon, Iona Grapes	1 00

October 23.

Gratuity : —	
William C. Clapp, Seckel Pears	1 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

November 20.

Benjamin V. French Fund.

Apples. — Baldwin, Mrs. A. W. Blake	5 00

Society's Prizes.

Apples. — Baldwin, Mrs. A. W. Blake	3 00
Second, J. W. Clark	2 00
Third, Mrs. Mary T. Goddard	1 00
Danvers Sweet, Benjamin P. Ware	3 00
Fletcher Russet, John Fletcher	3 00
Second, William H. Teele	2 00
Hubbardston, M. W. Chadbourne	3 00
Second, John Parker	2 00
Hunt Russet, Samuel Hartwell	3 00
Second, William H. Teele	2 00
Third, F. J. Boyden	1 00
Northern Spy, William O'Connell	3 00
Second, W. S. Janvrin	2 00
Third, George V. Fletcher	1 00
Rhode Island Greening, George V. Fletcher	3 00
Second, H. A. Wheeler	2 00
Third, F. J. Boyden	1 00

Roxbury Russet, George V. Fletcher	$3 00
Second, Warren Fenno	2 00
Third, F. J. Boyden	1 00
Tolman's Sweet, A. E. Underwood	3 00
Tompkins King, John W. Clark	3 00
Second, George C. Rice	2 00
Third, Walter E. Overend	1 00
Any other variety, A. E. Underwood, Yellow Bellflower	3 00
Second, O. R. Miller, Ben Davis	2 00
Third, F. J. Boyden, Palmer	1 00
PEARS. — Angouleme, A. T. Brown	4 00
Second, Frederick W. Damon	3 00
Third, Warren Fenno	2 00
Fourth, Mrs. Emmons	1 00
Anjou, George V. Fletcher	4 00
Second, William O'Connell	3 00
Third, Mrs. S. Klaus	2 00
Fourth, William Milman	1 00
Clairgeau, Warren Fenno	3 00
Second, W. S. Janvrin	2 00
Third, William T. Hall	1 00
Comice, A. T. Brown	4 00
Second, Mrs. Emmons	3 00
Third, Frederick W. Damon	2 00
Fourth, Walter E. Overend	1 00
Dana's Hovey, A. T. Brown	4 00
Second, Frederick W. Damon	3 00
Third, George V. Fletcher	2 00
Fourth, Warren Fenno	1 00
Diel, Mrs. Emmons	3 00
Second, Mrs. Whitney	2 00
Third, A. T. Brown	1 00
Glout Morceau, E. A. Hall	3 00
Second, W. H. Chipman	2 00
Third, Clifford R. Weld	1 00
Josephine of Malines, Warren Fenno	3 00
Second, Walter E. Overend	2 00
Third, John L. Bird	1 00
Langelier, Mrs. S. Klaus	3 00
Second, Clifford R. Weld	2 00
Third, T. M. Davis	1 00
Lawrence, W. S. Janvrin	3 00
Second, A. T. Brown	2 00
Third, Rufus T. Tobey	1 00
Vicar, Mrs. Jones	3 00
Second, A. T. Brown	2 00
Third, F. H. Gilson	1 00

Winter Nelis, Mrs. Emmons	$3 00
Second, A. T. Brown	2 00
Third, T. M. Davis	1 00
Any other variety, William Milman, Mount Vernon	3 00
Second, A. T. Brown, Bosc	2 00
Third, Frederick W. Damon, Sheldon	1 00
Foreign Grapes. — Two bunches of any variety, George McWilliam, Alicante	5 00
Second, George McWilliam, Lady Downes	4 00
Third, George McWilliam, Mrs. Pearson	3 00

Gratuity : —

George W. Campbell, Delaware, Ohio, Seedling Grape, Campbell's Early, First Class Certificate of Merit.

REPORT

OF THE

COMMITTEE ON VEGETABLES

FOR THE YEAR 1897.

By CHARLES N. BRACKETT, Chairman.

The past season has been an unusually trying one to the growers of vegetables. Owing to the too frequent rains, followed by cold cloudy weather during the growing season, many crops suffered severely, while some of the leading ones proved almost entire failures. It follows as a natural consequence that some of our exhibitions were to a greater or less extent affected from this cause. Yet, notwithstanding all the drawbacks and discouragements with which our contributors had to contend, the exhibits have on the whole been more satisfactory than we were led to expect.

Good cultivation, it is true, enters largely into our success as tillers of the soil, but it does not follow that he who tills best shall always have the largest yield. It matters not how fertile the soil when climatic influences are adverse. So much depends on atmospheric conditions during certain periods of plant growth that, although all other requisites are complete, total failures are sometimes the inevitable result, some sections being blest with abundant crops, while those of others are poor and imperfect. The cultivator, of all men, must continually feel himself at the mercy of the elements; he can never count with safety upon a crop until it is harvested.

During the winter months forced vegetables have been shown in about the usual quantity and variety, most of the prizes having been competed for and awarded.

On nearly every Saturday from the 2d of January to the 27th of November creditable exhibits of vegetables (forced or other) have been made in greater or less quantity, many of them of great excellence.

The weekly summer shows, while not presenting any extraordinary features, have generally been good, each week bringing many exhibitors and quite a throng of interested visitors, who seemed always ready to express their appreciation of the variety of objects placed upon the tables for their inspection.

As a complete list of contributors and the awards made to each constitutes a part of this report, we shall not attempt to describe, in detail, the exhibits made, but will only mention such as appear to be deserving of special notice, either as new or out of the ordinary line of exhibits.

The first of this kind which claimed our attention were some extraordinarily fine and well-grown specimens of Mushrooms (*Agaricus campestris*) shown by A. W. Crockford, February 6, and later, on several occasions, by James Comley, whose specimens have rarely, if ever, been excelled. May 15 P. G. Hanson showed remarkably large and well-grown Asparagus — four bunches, containing twelve stalks each, which weighed 10 lbs.

A new Pea was exhibited June 26 and July 3 by George D. Moore, under the name of Henderson's 1897, receiving the first prize on both occasions. The pods were large and well filled with peas of excellent quality, as we can testify from trial. We consider it a decided acquisition and worthy of trial.

We must not fail to mention the splendid specimens of Greenflesh Melons shown by Edward Russell, August 7. We think they were the finest ever seen in the Hall. A single specimen tipped the scales at 25½ lbs. They were certainly highly creditable to the skill of the grower, and formed the centre of attraction at this show.

By way of comparison with other seasons, it may be of interest to note the date of some of the first exhibits of a few of our most important vegetables.

The first Asparagus of the season was shown May 1, William H. Hunt receiving the first prize. Peas were exhibited for the first time June 19, Isaac E. Coburn showing two varieties. The first early Potatoes came from the Joseph S. Fay estate, July 3, and

were good enough to take all three of the prizes. The varieties were the Hebron, Rose, and Savoy. June 19, from the same place, came excellent specimens of Cauliflowers and three varieties of remarkably well-grown Lettuce, all of which were ample evidence of the skill of the gardener, M. H. Walsh. Tomatoes of outdoor growth were seen on our tables for the first time July 10, Sumner Coolidge and A. W. Blake being the exhibitors. The variety shown was Atlantic. This crop was among those which were badly injured by too much rain, and, although some fine specimens were on exhibition from time to time during the season, they were not shown in such large quantities and perfection as in previous seasons.

As usual, the closing weekly exhibition, September 11, was one of the most noteworthy of the season, and called forth a close competition from a large number of growers. There was a great variety, and most of the objects shown were at their best.

The Annual Exhibition, September 30 and October 1, was good, creditably sustaining this department of the Society's exhibitions. The large array of vegetables, comprising every seasonable variety, completely filled the Lower Hall and attracted much attention from the visiting public.

In speaking of the objects presented to the Committee for their examination on this occasion, we have only to say that the great and important feature of the exhibition was the total absence of ill-cultivated specimens. There were various degrees of excellence, it is true, but everything was excellent in its way. We may even add that some of the poorest specimens exhibited at this show would have carried away the first prizes less than twenty-five years ago.

The Potato and Tomato exhibits were much less in quantity than usual, both these crops having been more or less injured by unfavorable weather. The first prize for the best four varieties of Potatoes was awarded to F. J. Kinney, and B. S. Nickerson received the first for the best three varieties of Tomatoes.

There was also a very fine show of Celery on this occasion, the principal exhibitors being Messrs. Heustis, Bruce, Coolidge, and Hartshorn.

William N. Craig's collection of six varieties of remarkably well-grown Onions was deserving of special mention, he taking the first and second prizes in three different classes.

The interest manifested in our Native Mushrooms, noticed in our report last year, still continues without abatement, attracting a throng of interested persons at each and every exhibit that has been made throughout the season. All the prizes offered in the Schedule have been awarded.

Before closing this report we would call the attention of contributors to important changes and alterations in the Schedule for the coming year. The four prizes for the best collections of vegetables covering fifty square feet, arranged for effect, at the Annual Exhibition, which have been in the Schedule for the past two years, have been dropped, it being the unanimous opinion of the Committee that the amount devoted to this purpose could be more advantageously employed in furthering the interests of the Society in a different direction.

The amount appropriated for Vegetables for 1897 was	$1,200 00
The Committee have awarded in prizes and gratuities,	1,157 00
Leaving an unexpended balance of . . .	$43 00

All of which is respectfully submitted.

For the Committee,

C. N. Brackett, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

1897.

January 2.

Gratuities : —

Warren Heustis & Son, Celery $1 00
James Comley, " 1 00
Norris R. Comley, Rhubarb 1 00

January 9.

Radishes. — Four bunches of any variety, Arthur F. Coolidge . 3 00
Cucumbers. — Pair of any variety, Francis Blake 3 00
Second, Nathaniel T. Kidder 2 00
Third, E. B. Smith 1 00
Cauliflowers. — Four specimens, William H. Teele . . . 3 00
Lettuce. — Four heads of Tennisball, Arthur F. Coolidge . . 3 00
Second, E. B. Smith 2 00
Third, B. S. Nickerson 1 00
Parsley. — Two quarts, W. N. Craig 2 00
Second, Arthur F. Coolidge 1 00
Tomatoes. — Twelve specimens, William C. Winter, Stone . . 3 00
Second, William C. Winter, Livingston's 2 00
Third, Francis Blake, Essex 1 00

Gratuities : —

Hon. Aaron Low, Spinach 1 00
Warren Heustis & Son, Celery 1 00
Mrs. E. M. Gill, Mushrooms 1 00

January 16.

Gratuities : —

Warren Heustis & Son, Celery 1 00
Norris R. Comley, Rhubarb 1 00

January 23.

Gratuities : —

Hon. Aaron Low, Spinach 1 00
Mrs. E. M. Gill, Mushrooms 1 00
George D. Moore, Lettuce 1 00

February 6.

Radishes. — Four bunches of any variety, Arthur F. Coolidge . 2 00
Second, Joshua C. Stone 1 00
Cucumbers. — Pair of any variety, Francis Blake 3 00
Second, H. J. Lund 2 00

Dandelions. — Peck, Warren Heustis & Son	$3 00
Lettuce. — Four heads of Tennisball, George D. Moore	3 00
Second, Joshua C. Stone	2 00
Third, Arthur F. Coolidge	1 00
Mushrooms. — Twenty-four specimens, A. W. Crockford	3 00
Rhubarb. — Twelve stalks, C. F. Smith	3 00
Second, George Sanderson	2 00
Tomatoes. — Twelve specimens, Charles H. Hovey, South Pasadena, Cal.	3 00
Second, Francis Blake	2 00
Third, William C. Winter	1 00

Gratuities : —

Warren Heustis & Son, Celery	1 00
Arthur F. Coolidge, "	1 00
Hon. Aaron Low, Spinach	1 00
A. W. Crockford, Mushrooms	1 00
Mrs. E. M. Gill, "	1 00

February 13.

Gratuity : —

Warren Heustis & Son, Dandelions	1 00

February 20.

Gratuities : —

George D. Moore, Radishes	1 00
Warren Heustis & Son, Dandelions	1 00

February 27.

Gratuities : —

George D. Moore, Radishes	1 00
Hon. Aaron Low, Spinach	1 00
Arthur F. Coolidge, Collection	2 00

March 6.

Gratuities : —

Mrs. E. M. Gill, Mushrooms	1 00
Warren Heustis & Son, Dandelions	1 00

March 13.

Gratuities : —

E. B. Smith, Cucumbers	1 00
Hon. Aaron Low, Spinach	1 00
A. W. Crockford, Radishes	1 00
Arthur F. Coolidge, Collection	2 00

March 20.

Gratuities : —

E. B. Smith, Cucumbers	1 00
George D. Moore, Collection	2 00
Arthur F. Coolidge, "	1 00

SPRING EXHIBITION.

MARCH 23, 24, 25, AND 26.

Prizes from the William J. Walker Fund.

RADISHES. — Four bunches of Turnip Rooted, H. R. Kinney	$2 00
Second, George D. Moore	1 00
Four bunches of Long Scarlet, H. R. Kinney	2 00
CUCUMBERS. — Pair of White Spine, George D. Moore	3 00
Second, E. B. Smith	2 00
CELERY. — Four roots, the third prize to H. R. Kinney	1 00
DANDELIONS. — Peck, Warren Heustis & Son	3 00
Second, Hon. Aaron Low	2 00
Third, Arthur F. Coolidge	1 00
LETTUCE. — Four heads of Tennisball, George D. Moore	3 00
Second, D. L. Tappan	2 00
Third, Arthur F. Coolidge	1 00
WATER CRESS. — Two quarts, Benjamin P. Ware	2 00
PARSLEY. — Two quarts, W. N. Craig	2 00
Second, H. R. Kinney	1 00
MUSHROOMS. — Twenty-four specimens, A. W. Crockford	3 00
Second, H. R. Kinney	2 00
Third, E. S. Converse	1 00
RHUBARB. — Twelve stalks, George Sanderson	3 00
Second, Joshua C. Stone	2 00
Third, James Comley	1 00
TOMATOES. — Twelve specimens, Francis Blake	3 00
Second, W. N. Craig, May's Favorite	2 00
Third, W. N. Craig, Eclipse	1 00
Gratuities : —	
Benjamin P. Ware, Brussels Sprouts	1 00
Warren Heustis & Son, Parsley	1 00
Hon. Aaron Low, Collection	3 00
George D. Moore, "	2 00

MARCH 27.

Gratuity : —	
George D. Moore, Lettuce and Cucumbers	1 00

APRIL 3.

CUCUMBERS. — Pair of White Spine, Varnum Frost	3 00
Second, George D. Moore	2 00
Third, E. B. Smith	1 00
Gratuities : —	
W. N. Craig, Tomatoes	1 00
Hon. Aaron Low, Dandelions	1 00
George D. Moore, Collection	2 00

April 10.

Gratuity : —

James Comley, Collection	$2 00

April 17.

Gratuities : —

James Comley, Mushrooms and Lettuce	2 00
Mrs. E. M. Gill, Mushrooms	1 00
Warren Heustis & Son, Dandelions	1 00

April 24.

Gratuities : —

James Comley, Mushrooms	1 00
Warren Heustis & Son, Dandelions	1 00
Hon. Aaron Low, Collection	1 00

MAY EXHIBITION.

May 1.

Prizes from the William J. Walker Fund.

Asparagus. — Four bunches, twelve stalks each, William H. Hunt,	3 00
Second, Varnum Frost	2 00
Third, P. G. Hanson	1 00
Cucumbers. — Pair of White Spine, Varnum Frost	3 00
Second, George D. Moore	2 00
Third, Arthur F. Coolidge	1 00
Spinach. — Peck, Joshua C. Stone	3 00
Second, Arthur F. Coolidge	2 00
Third, Hon. Aaron Low	1 00
Dandelions. — Peck, George D. Moore	2 00
Second, Varnum Frost	1 00
Lettuce. — Four heads, Arthur F. Coolidge	3 00
Second, Joshua C. Stone	2 00
Third, Mrs. Mary T. Goddard	1 00
Rhubarb. — Twelve stalks, Hon. Aaron Low	2 00
Second, Warren Heustis & Son	1 00

Gratuities : —

Mrs. Mary T. Goddard, Cauliflowers	1 00
H. R. Kinney, Radishes	1 00
William Nicholson, Tomatoes	1 00
W. C. Winter, "	1 00
James Comley, Mushrooms	2 00
Warren Heustis & Son, Dandelions	1 00
W. N. Craig, Collection	3 00
Arthur F. Coolidge, "	2 00
Hon. Aaron Low, "	1 00

May 8.

Gratuities : —

P. G. Hanson, Asparagus	$1 00
Warren Heustis & Son, Rhubarb	1 00
Varnum Frost, Cucumbers	1 00
Arthur F. Coolidge, Collection	3 00

May 15.

Gratuities : —

P. G. Hanson, Asparagus (weight of four bunches, ten pounds)	1 00
William H. Hunt, Asparagus	1 00
James Comley, Mushrooms	1 00
Arthur F. Coolidge, Collection	2 00
Warren Heustis & Son, "	1 00
Hon. Aaron Low, "	1 00

May 22.

Gratuities : —

P. G. Hanson, Asparagus	1 00
W. H. Hunt, "	1 00
James Comley, Mushrooms	1 00
George D. Moore, Collection	2 00
Hon. Aaron Low, "	1 00
Warren Heustis & Son, "	1 00

May 29.

Gratuity : —

Warren Heustis & Son, Collection	1 00

RHODODENDRON SHOW.

June 3 and 4.

Prizes from the Theodore Lyman Fund.

Beets. — Twelve specimens, any variety, H. R. Kinney	3 00
Second, Arthur F. Coolidge	2 00
Third, Warren Heustis & Son	1 00
Carrots. — Twelve Short Scarlet, W. N. Craig	3 00
Second, Warren Heustis & Son	2 00
Radishes. — Four bunches of Turnip Rooted, Warren Heustis & Son,	2 00
Second, George D. Moore	1 00
Four bunches of Long Scarlet, George D. Moore	2 00
Second, H. R. Kinney	1 00
Asparagus. — Four bunches, twelve stalks each, P. G. Hanson	3 00
Second, William H. Hunt	2 00
Cucumbers. — Pair, George D. Moore	3 00
Second, H. R. Kinney	2 00
Third, Arthur F. Coolidge	1 00

Lettuce. — Four heads, George D. Moore	$3 00
Second, Arthur F. Coolidge	2 00
Third, Warren Heustis & Son	1 00
Rhubarb. — Twelve stalks, George D. Moore	3 00
Second, Warren Heustis & Son	2 00
Third, W. N. Craig	1 00
Mushrooms. — Twenty-four specimens, H. R. Kinney	3 00
Second, Mrs. E. M. Gill	2 00
Tomatoes. — Twelve specimens, William C. Winter, Livingston	3 00
Second, William C. Winter, Stone	2 00
Third, M. S. Stevens, May's Favorite	1 00
Gratuities: —	
Warren Heustis & Son, Collection	2 00
George D. Moore, "	2 00
Arthur F. Coolidge, "	1 00
John Jeffries, "	1 00
Hon. Aaron Low, "	1 00

June 12.

Gratuities: —	
Hon. Joseph S. Fay, Cauliflowers and four varieties of Lettuce	3 00
Mrs. E. M. Gill, Mushrooms	1 00
George D. Moore, Collection	2 00
Hon. Aaron Low, "	1 00
W. N. Craig, "	1 00
Warren Heustis & Son, Collection	1 00

June 19.

Gratuities: —	
Estate of Joseph S. Fay, Cauliflowers and Lettuce	2 00
I. E. Coburn, two varieties of Peas	1 00

ROSE AND STRAWBERRY SHOW.

June 22 and 23.

Beets. — Twelve Summer Turnip Rooted, H. R. Kinney	3 00
Second, Warren Heustis & Son	2 00
Third, Arthur F. Coolidge	1 00
Onions. — Twelve specimens, W. N. Craig	3 00
Second, George D. Moore	2 00
Third, E. C. Lewis	1 00
Cucumbers. — Pair of White Spine, George D. Moore	3 00
Second, Arthur F. Coolidge	2 00
Third, H. R. Kinney	1 00
Any other variety, George D. Moore, Eureka	3 00
Cabbages. — Three of any variety, trimmed, George D. Moore, Early Spring	3 00
Second, George D. Moore, Wakefield	2 00

Lettuce. — Four heads of any variety, George D. Moore	$2 00
Second, Warren Heustis & Son	1 00
Peas. — Half-peck of any variety, E. C. Lewis, Nott's Excelsior	3 00
Second, Estate of Joseph S. Fay, American Wonder	2 00
Third, Elliott Moore, " "	1 00
Gratuities: —	
Estate of Joseph S. Fay, Cauliflowers	1 00
W. N. Craig, "	1 00
Warren Heustis & Son, Tomatoes	1 00
William C. Winter, "	1 00
George D. Moore, Collection	2 00

June 26.

Onions. — Twelve specimens, George D. Moore	2 00
Second, Sumner Coolidge	1 00
Squashes. — Four Long Warted, Sumner Coolidge	2 00
Four Scalloped, Sumner Coolidge	2 00
Cabbages. — Three of any variety, trimmed, George D. Moore, Early Spring	3 00
Second, George D. Moore, Wakefield	2 00
Third, Warren Heustis & Son	1 00
Peas. — Half-peck of American Wonder, Estate of Joseph S. Fay	3 00
Second, Hon. Aaron Low	2 00
Third, H. R. Kinney	1 00
Half-peck of any other variety, George D. Moore, Henderson's 1897	3 00
Second, John L. Gardner, Nott's Excelsior	2 00
Third, E. C. Lewis, " "	1 00
Gratuities: —	
Warren Heustis & Son, Collection	1 00
John Jeffries, "	1 00
E. C. Lewis, "	1 00
George D. Moore, "	1 00
Hon. Aaron Low, "	1 00

July 3.

Potatoes. — Twelve specimens, Estate of Joseph S. Fay, Hebron	3 00
Second, Estate of Joseph S. Fay, Savoy	2 00
Third, Estate of Joseph S. Fay, Rose	1 00
Peas. — Half-peck of any variety, George D. Moore, Henderson's 1897	3 00
Second, Hon. Aaron Low, American Wonder	2 00
Third, Estate of Joseph S. Fay, Advancer.	1 00

Gratuities: —

William C. Winter, Tomatoes	$1 00
Warren Heustis & Son, Collection	1 00
Hon. Aaron Low, "	1 00
George D. Moore, "	1 00
Arthur F. Coolidge, "	1 00

JULY 10.

Prizes from the Levi Whitcomb Fund.

CABBAGES. — Three Drumhead, trimmed, George D. Moore, Brunswick	3 00
Second, George D. Moore, Stone Mason	2 00
BEANS. — Half-peck of Cranberry, Joshua C. Stone	3 00
Second, Isaac E. Coburn	2 00
TOMATOES. — Open culture, twelve specimens, Sumner Coolidge, Atlantic	3 00
Second, A. W. Blake	2 00

Gratuities: —

Hon. Aaron Low, Collection of Peas	1 00
I. E. Coburn, " " "	1 00
Arthur F. Coolidge, Collection of Beans	1 00
Warren Heustis & Son, Collection	1 00
E. C. Lewis, "	1 00
George D. Moore, "	1 00
W. N. Craig, "	1 00

JULY 17.

POTATOES. — Twelve specimens, Estate of Joseph S. Fay, Hebron	3 00
Second, Hon. Aaron Low, Fortune	2 00
Third, Estate of Joseph S. Fay, Rose	1 00
LETTUCE. — Four heads of any variety, John Jeffries	2 00
Second, Estate of Joseph S. Fay	1 00
SWEET CORN. — Twelve ears, Sumner Coolidge, Hybrid	3 00
Second, Sumner Coolidge, Cory	2 00
Third, Joshua C. Stone, "	1 00
TOMATOES. — Open culture, twelve specimens, Sumner Coolidge, Atlantic	3 00
Second, Arthur F. Coolidge, May's Favorite	2 00
Third, A. W. Blake, Atlantic	1 00

Gratuities: —

Nathaniel T. Kidder, Tomatoes	1 00
Warren Heustis & Son, Collection	1 00
George D. Moore, "	1 00
Hon. Aaron Low, "	1 00
Estate of Joseph S. Fay, "	1 00

JULY 24.

POTATOES. — Any variety, twelve specimens, Estate of Joseph S. Fay, Hebron	$3 00
Second, Estate of Joseph S. Fay, Savoy	2 00
Third, Hon. Aaron Low, Early Essex	1 00
PEAS. — Half-peck of any variety, Hon. Aaron Low, New Life	3 00
Second, Hon. Aaron Low, Heroine	2 00
SWEET CORN. — Twelve ears of Crosby, Sumner Coolidge	3 00
Second, John C. Stone	2 00
Twelve ears of any other variety, Sumner Coolidge, Hybrid	3 00
Second, Samuel Hartwell, Cory	2 00
Third, Sumner Coolidge, Cory	1 00
TOMATOES. — Twelve specimens, Sumner Coolidge, Atlantic	3 00
Second, Isaac E. Coburn, Comrade	2 00
Third, Sumner Coolidge, Seedling	1 00
NATIVE MUSHROOMS. — Named collection of not less than five edible varieties, Miss Ellen W. Rumrill	4 00
Second, Mrs. Kate E. Parker	3 00
Third, Miss Constance Alexander and Miss Annie Scorgie	2 00
Gratuity : —	
Miss Helen M. Noyes, Collection of Mushrooms	2 00

JULY 31.

BEANS. — Two quarts of Goddard, shelled, Warren Heustis & Son	3 00
Half-peck of Horticultural, Isaac E. Coburn	3 00
Second, Hon. Aaron Low	2 00
Third, Joshua C. Stone	1 00
TOMATOES. — Twelve specimens of Comrade, Isaac E. Coburn	3 00
Second, Hon. Aaron Low	2 00
Third, Joshua C. Stone	1 00
Twelve specimens of any other variety, Sumner Coolidge, Atlantic,	3 00
Second, Arthur F. Coolidge, Atlantic	2 00
Third, Joshua C. Stone, Boston Market	1 00
EGG PLANT. — Four specimens of Round Purple, Sumner Coolidge,	3 00
Second, Arthur F. Coolidge	2 00
Gratuities : —	
Joshua C. Stone, Melons	1 00
Warren Heustis & Son, Collection	1 00
Arthur F. Coolidge, "	1 00
Hon. Aaron Low, "	1 00

AUGUST 7.

GREENFLESH MELONS. — Four specimens, Edward Russell (weight of largest specimen, 25½ lbs.)	3 00
Second, Joshua C. Stone	2 00

Sweet Corn. — Twelve ears, Joshua C. Stone	$3 00
Second, Hon. Aaron Low, Quincy Market	2 00
Third, Hon. Aaron Low, Crosby	1 00
Egg Plant. — Four specimens of Round Purple, Sumner Coolidge,	2 00
Second, Arthur F. Coolidge	1 00

August 14.

Potatoes. — Twelve specimens of any variety, Estate of Joseph S. Fay, Hebron	3 00
Second, Estate of Joseph S. Fay, Queen	2 00
Third, Estate of Joseph S. Fay, Rose	1 00
Onions. — Twelve specimens, W. N. Craig	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00
Greenflesh Melons. — Four specimens, Joshua C. Stone	3 00
Second, Arthur F. Coolidge	2 00
Celery. — Four roots of any variety, Arthur F. Coolidge	3 00
Second, Warren Heustis & Son	2 00
Beans. — Two quarts of Large Lima, Warren Heustis & Son	3 00
Second, Sumner Coolidge	2 00
Two quarts of Goddard, shelled, Isaac E. Coburn	3 00
Second, Warren Heustis & Son	2 00
Third, Rev. Calvin Terry	1 00
Sweet Corn. — Twelve ears of Potter's Excelsior, Joshua C. Stone,	3 00
Second, Arthur F. Coolidge	2 00
Twelve ears of any other variety, P. G. Hanson, Crosby's Improved,	3 00
Second, Samuel Hartwell, Burr's	2 00
Third, Joshua C. Stone, Quincy Market	1 00
Peppers. — Twelve specimens of Squash, Arthur F. Coolidge	3 00
Second, George W. Jameson	2 00
Third, Hon. Aaron Low	1 00
Any other variety, Hon. Aaron Low, Spanish Monstrous	3 00
Second, Hon. Aaron Low, Elephant's Trunk	1 00

August 21.

Greenflesh Melons. — Four specimens, Joshua C. Stone	3 00
Second, Arthur F. Coolidge	2 00
Salmon Flesh Melons. — Four specimens, the third prize to Joshua C. Stone	1 00
Watermelons. — Pair, Joshua C. Stone	3 00
Cabbages. — Three of any variety, trimmed, Hon. Aaron Low	3 00
Second, Warren Heustis & Son	2 00
Third, Arthur F. Coolidge	1 00
Celery. — Four roots, Arthur F. Coolidge	3 00
Second, Warren Heustis & Son	2 00

Beans. — Two quarts of Large Lima, Warren Heustis & Son	$3 00
Second, Sumner Coolidge	2 00
Two quarts of Dwarf Lima, Warren Heustis & Son	3 00
Martynias. — Twelve specimens, Hon. Aaron Low	2 00
Native Mushrooms. — Named collection of not less than five edible varieties, Miss Ellen W. Rumrill	3 00
Second, Mrs. Sarah L. Woodward	2 00

Gratuities : —

Mrs. Mary T. Goddard, Tomatoes	1 00
E. C. Lewis, Collection	4 00
Arthur F. Coolidge, Collection	2 00

September 4.

Gratuity : —

Warren Heustis & Son, Paris Golden Celery	1 00

September 11.

Turnips. — Twelve Flat, F. J. Kinney	3 00
Second, Hon. Aaron Low	2 00
Third, C. L. Hartshorn	1 00
Greenflesh Melons. — Four specimens, Samuel Hartwell	3 00
Second, E. C. Lewis	2 00
Third, E. C. Lewis	1 00
Salmon Flesh Melons. — Four specimens, Joshua C. Stone	3 00
Second, E. C. Lewis	2 00
Third, Joshua C. Stone	1 00
Watermelons. — Two specimens, Joshua C. Stone	3 00
Cauliflowers. — Four specimens, De Souza Brothers	3 00
Second, William H. Teele	2 00
Third, Elliott Moore	1 00
Lettuce. — Four heads of any variety, Arthur F. Coolidge	3 00
Second, Sumner Coolidge	2 00
Third, E. C. Lewis	1 00
Celery. — Four roots of any variety, Warren Heustis & Son	3 00
Second, Arthur F. Coolidge	2 00
Third, George D. Moore	1 00
Parsley. — Two quarts, Arthur F. Coolidge	2 00
Second, John Jeffries	1 00
Beans. — Large Lima, two quarts, Mrs. Mary T. Goddard	3 00
Second, Warren Heustis & Son	2 00
Third, E. C. Lewis	1 00
Corn. — Sweet, twelve ears of Potter's Excelsior, Rev. Calvin Terry	3 00
Second, Hon. Aaron Low	2 00
Third, Mrs. Mary T. Goddard	1 00

Any other Sweet variety, C. L. Hartshorn	$3 00
Second, O. R. Robbins	2 00
Third, Hon. Aaron Low, Champion	1 00
Egg Plant. — Four specimens of Round Purple, Sumner Coolidge,	3 00
Second, George D. Moore	2 00
Third, E. C. Lewis	1 00
Tomatoes. — Three varieties, twelve specimens each, Arthur F. Coolidge	5 00
Second, Isaac E. Coburn	4 00
Third, Hon. Aaron Low	3 00
Twelve Aristocrat, Varnum Frost	3 00
Second, Hon. Aaron Low	2 00
Third, E. C. Lewis	1 00
Twelve Comrade, Isaac E. Coburn	3 00
Second, Hon. Aaron Low	2 00
Third, Joshua C. Stone	1 00
Twelve May's Favorite, Varnum Frost	3 00
Second, Mrs. Mary T. Goddard	2 00
Third, Hon. Aaron Low	1 00
Twelve of any other variety, Varnum Frost, Stone	3 00
Second, Isaac E. Coburn, Stone	2 00
Third, Isaac E. Coburn, Ignotum	1 00
Martynias. — Twelve specimens, Hon. Aaron Low	2 00
Second, George W. Jameson	1 00
Okra. — Twelve specimens, E. C. Lewis	2 00
Peppers. — Twelve specimens of Squash, Hon. Aaron Low	2 00
Second, George Lincoln	1 00
Any other variety, E. C. Lewis, Ruby King	2 00
Second, C. L. Hartshorn, Bull Nose	1 00
Native Mushrooms. — Named collection, not less than five edible varieties, Miss Helen M. Noyes	3 00
Second, Miss Ellen W. Rumrill	2 00
Gratuities : —	
W. N. Craig, three varieties of Onions	2 00
Warren Heustis & Son, Celery	1 00
George D. Moore, Collection	2 00

September 18.

Gratuities : —	
William Doran & Son, Tomatoes	1 00
Warren Heustis & Sons, Celery	1 00
Rev. Calvin Terry, Collection	1 00

September 25.

Gratuity : —	
John Jeffries, Collection	1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 30 AND OCTOBER 1.

Regular Prizes.

BEETS. — Twelve Turnip Rooted, Varnum Frost	$3 00
Second, P. G. Hanson	2 00
Third, Joshua C. Stone	1 00
CARROTS. — Twelve Long Orange, H. R. Kinney	3 00
Second, Joseph Thorp	2 00
Third, E. C. Lewis	1 00
Twelve Intermediate, H. R. Kinney	3 00
Second, Mrs. Mary T. Goddard	2 00
PARSNIPS. — Twelve Long, George D. Moore	3 00
Second, H. R. Kinney	2 00
Third, E. C. Lewis	1 00
POTATOES. — Four varieties, twelve specimens each, F. J. Kinney	5 00
Second, Mrs. Mary T. Goddard	4 00
Third, C. H. Thomas	3 00
Twelve Carman No. 1, Elliott Moore	3 00
Second, Hon. Aaron Low	2 00
Third, C. H. Thomas	1 00
Twelve Clark, F. J. Kinney	3 00
Second, C. H. Thomas	2 00
Third, Mrs. Mary T. Goddard	1 00
Twelve Hebron, F. J. Kinney	3 00
Second, E. C. Lewis	2 00
Third, Henry E. Rich	1 00
Twelve Rose, H. R. Kinney	3 00
Second, Henry E. Rich	2 00
Third, C. H. Thomas	1 00
Twelve of any other variety, F. J. Kinney, New Queen	3 00
Second, Henry E. Rich, American Wonder	2 00
Third, E. M. Bruce, New Queen	1 00
SALSIFY. — Twelve specimens, J. J. Lyons	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00
TURNIPS. — Twelve Flat, F. J. Kinney	3 00
Second, C. H. Thomas	2 00
Third, Elliott Moore	1 00
Twelve Swedish, F. J. Kinney	3 00
Second, Joseph Thorp	2 00
ONIONS. — Twelve Danvers, W. N. Craig	3 00
Second, W. N. Craig, Yellow Globe	2 00
Third, C. L. Hartshorn	1 00
Twelve Red, W. N. Craig, Red Globe	3 00
Second, W. N. Craig, Wethersfield	2 00
Third, C. L. Hartshorn	1 00

Twelve White, C. L. Hartshorn	$2 00
Second, E. C. Lewis	1 00
Any other variety, W. N. Craig, Ailsa Craig	3 00
Second, W. N. Craig, Prizetaker	2 00
Third, C. L. Hartshorn, "	1 00
SQUASHES. — Three Bay State, Warren Heustis & Son	3 00
Second, E. C. Lewis	2 00
Third, Hon. Aaron Low	1 00
Three Hubbard, P. G. Hanson	3 00
Second, Arthur F. Coolidge	2 00
Third, C. L. Hartshorn	1 00
Three Hybrid Turban, P. G. Hanson	3 00
Second, C. L. Hartshorn	2 00
Third, E. C. Lewis	1 00
Three Marblehead, P. G. Hanson	3 00
Second, E. C. Lewis	2 00
Three Marrow, Varnum Frost	3 00
Second, Warren Heustis & Son	2 00
Third, Arthur F. Coolidge	1 00
Any other variety, C. L. Hartshorn	3 00
Second, Benjamin K. Bliss, Pride of the Amazon	2 00
Third, Hon. Aaron Low, Plymouth Rock	1 00
WATERMELONS. — Two specimens, B. S. Nickerson	3 00
Second, Hon. Aaron Low	2 00
Third, Elliott Moore	1 00
BRUSSELS SPROUTS. — Half-peck, John Jeffries	3 00
Second, H. R. Kinney	2 00
Third, E. C. Lewis	1 00
CABBAGES. — Three Drumhead, trimmed, Hon. Aaron Low	3 00
Second, E. C. Lewis	2 00
Third, Mrs. Mary T. Goddard	1 00
Three Red, trimmed, Hon. Aaron Low	3 00
Second, Samuel Hartwell	2 00
Third, H. R. Kinney	1 00
Three Savoy, trimmed, Samuel Hartwell	3 00
Second, Mrs. Mary T. Goddard	2 00
Third, H. R. Kinney	1 00
CAULIFLOWERS. — Four specimens, William H. Teele	5 00
Second, De Souza Brothers	4 00
Third, John McCarthy	3 00
CELERY. — Four roots of Paris Golden, best kept during the Exhibition, Warren Heustis & Son	5 00
Second, Arthur F. Coolidge	4 00
Third, C. L. Hartshorn	3 00
Fourth, E. M. Bruce	2 00
Any other variety, E. M. Bruce, Perle le Grande	5 00
Second, E. M. Bruce, New Queen	4 00

Third, Arthur Nixon	$3 00
Fourth, H. R. Kinney	2 00
Endive. — Four specimens, H. R. Kinney	3 00
Second, Mrs. Haller	2 00
Third, E. C. Lewis	1 00
Lettuce. — Four heads, C. L. Hartshorn	3 00
Second, George D. Moore	2 00
Third, Arthur F. Coolidge	1 00
Parsley. — Two quarts, John Jeffries	2 00
Second, Arthur F. Coolidge	1 00
Horseradish. — Six roots, H. R. Kinney	2 00
Second, George D. Moore	1 00
Corn. — Yellow or Field, twenty-five ears, traced, Elliott Moore,	3 00
Second, Henry E. Rich	2 00
Third, Henry E. Rich	1 00
Sweet, twelve ears, Isaac E. Coburn, Potter's Excelsior	3 00
Second, Mrs. E. M. Gill, Bourne's Favorite	2 00
Third, Hon. Aaron Low	1 00
Egg Plant. — Four specimens of Round Purple, Sumner Coolidge,	3 00
Second, H. R. Kinney	2 00
Third, George D. Moore	1 00
Tomatoes. — Three varieties, twelve specimens, B. S. Nickerson	5 00
Second, Arthur F. Coolidge	4 00
Third, Hon. Aaron Low	3 00
Twelve Aristocrat, Joseph Thorp	3 00
Second, Hon. Aaron Low	2 00
Third, Isaac E. Coburn	1 00
Twelve Comrade, Isaac E. Coburn	3 00
Second, Hon. Aaron Low	2 00
Third, Joshua C. Stone	1 00
Twelve May's Favorite, Hon. Aaron Low	3 00
Twelve of any other variety, I. E. Coburn, Stone	3 00
Second, W. Warburton, Stone	2 00
Third, Joseph Thorp, Stone	1 00
Peppers. — Twelve specimens of Squash, Hon. Aaron Low	3 00
Second, P. G. Hanson	2 00
Third, C. L. Hartshorn	1 00
Twelve of any other variety, Hon. Aaron Low, Ruby King	3 00
Second, Hon. Aaron Low, Bull Nose	2 00
Third, C. L. Hartshorn, Bull Nose	1 00
Culinary Herbs. — Collection, named, W. N. Craig	5 00
Collection of Vegetables. — Covering fifty square feet, arranged for effect, H. R. Kinney	15 00
Second, E. C. Lewis	12 00
Third, Warren Heustis & Son	10 00
Fourth, C. L. Hartshorn	8 00

Gratuities: —

Elliott Moore, White Egg Turnips	$1 00
" " Golden Hubbard Squashes	1 00
M. B. Faxon, Collection of Squashes	1 00
E. C. Lewis, Peas	1 00
Hon. James J. H. Gregory, Peas	1 00
Mrs. E. M. Gill, Lima Beans	1 00
Mrs. Mary T. Goddard, Collection of Beans	2 00
W. N. Craig, Collection	5 00
George D. Moore, "	1 00
John Jeffries, "	1 00

OCTOBER 9.

Gratuity: —

Warren Heustis & Son, Cucumbers and Celery	1 00

OCTOBER 16.

Gratuities: —

Mrs. E. M. Gill, Lima Beans	1 00
Warren Heustis & Son, Celery and Cucumbers	1 00

OCTOBER 23.

Gratuities: —

George D. Moore, Parsnips and Lettuce	1 00
Hon. Aaron Low, Salsify and Turnips	1 00

OCTOBER 30.

Gratuities: —

George D. Moore, Celery and Salsify	1 00
Warren Heustis & Son, Celery and Cucumbers	1 00

NOVEMBER 6.

Gratuities: —

John Jeffries, Parsley	1 00
Warren Heustis & Son, Celery	1 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

NOVEMBER 20.

CUCUMBERS. — Pair, Francis Blake	3 00
Second, Warren Heustis & Son	2 00
Third, C. A. Learned	1 00
CABBAGES. — Three, Red, trimmed, Hon. Aaron Low	3 00
Second, Warren Heustis & Son	2 00
Third, Mrs. Mary T. Goddard	1 00
Three Savoy, Mrs. Mary T. Goddard	3 00
CAULIFLOWERS. — Four specimens, William H. Teele	3 00
Second, B. A. De Souza	2 00

Brussels Sprouts. — Half-peck, John Jeffries, Giant	$3 00
Second, John Jeffries, Dwarf French	2 00
Third, Hon. Aaron Low	1 00
Celery. — Four roots, E. C. Lewis	3 00
Second, Warren Heustis & Son	2 00
Third, Arthur F. Coolidge	2 00
Lettuce. — Four heads, George D. Moore	3 00
Second, Arthur F. Coolidge	2 00
Third, C. A. Learned	1 00
Tomatoes. — Twelve specimens, grown under glass, W. C. Winter, Stone	3 00
Second, W. C. Winter, May's Favorite	2 00
Third, W. C. Winter, Chemin	1 00

Gratuities : —

William Warburton, Parsnips	1 00
E. C. Lewis, Collection	3 00
Warren Heustis & Son, Collection	1 00
John Jeffries, "	1 00

REPORT

OF THE

Committee on School Gardens and Children's Herbariums

FOR THE YEAR 1897.

By HENRY LINCOLN CLAPP, Chairman.

GEORGE PUTNAM SCHOOL GARDEN, ROXBURY.

The following named plants were set out in the garden during the season of 1897:

Arenaria lateriflora,
Cypripedium arietinum,
" *pubescens*,
" *spectabile*,
Geum rivale,
Viola lanceolata,
" *rostrata*.

The garden has been used as in previous years, but more extensively. Whole classes have visited it repeatedly to observe the plants, and plant material has been taken from it to be studied in the class room. Ferns and composite flowers have received the most attention. Already the pupils of the ninth grade have become quite familiar with fourteen species of ferns, which have been studied in the customary manner, — by means of lantern-slides, pressed specimens, and the ferns growing in the fernery.

Each member of the class has a notebook carefully kept, and containing pinnæ or fronds of every fern studied. Miss L. D. Ellis, a member of the class in 1896, won Mr. Davenport's first prize of fifty choice ferns, at the Herbarium Exhibition in November, 1897.

Excellent opportunities have been found for making lantern-slides from the fern crosiers in different stages of growth as seen in the fernery.

On account of the wetness of the season the plants as a whole have made exceptionally fine growths, especially the asters and golden-rods.

REPORT OF THE MEDFORD SCHOOL GARDENS.

Having once more become associated with the schools of Medford, I have during the past year made an effort to improve the Swan School Garden, and have added a large number of native plants to its flora.

Through the generosity of the Malden Park Commissioners I have been able to enrich the garden, especially the fern beds, with some twenty-five loads of peat mould from Fellsmere, and over two hundred fern roots, interspersed with asters and golden-rods, of different species, have been massed in the beds along the shady side of the fences. The rockery has been restocked with hepaticas, blood-roots, columbines, herb Robert, and other rock-loving plants, with polypodiums, woodsias, marginal shield fern and Christmas fern, and several choice native shrubs have been added to the garden. As, however, I intend adding others in the spring, and contemplate making still further efforts to establish the garden on a permanent basis of usefulness for nature study in the school, I shall not submit a special report for this year.

I wish, however, to call the attention of the Committee to the Curtis School Garden, which is beginning to assume proportions that entitle it to the highest consideration of this Committee.

Under the able supervision of Miss Amy Jones, the principal of the school, and her assistant, Miss Laura Davenport (one of the pioneers of nature work in the Medford schools), the garden has developed from a very modest beginning into a strong competitor for one of the prizes offered by this Committee, and bids fair to become a still more formidable one in the near future.

A large portion of the garden has been devoted to the usual garden flowers for the pleasure of the children, — a practice which I believe to be a wise one where only young children of the first, second, and third grades are concerned, — but some twelve native trees and shrubs and upward of fifty species of native flowering plants and ferns have been grown and made use of in the nature work in the school. Some of the nature work done from studies of these native plants by some of the youngest pupils in the school

has been of unusual excellence, and reflected great credit on the teachers and children.

Among the choice native shrubs are a seedling catalpa from the Swan School Garden, and a fine plant each of *Kalmia latifolia* (mountain laurel) and *Rhododendron maximum*, the gift of Miss Davenport, who resigned her position as teacher in the school in September, in order to assume other duties elsewhere.

The school is fortunate in having for its garden so earnest a worker as Miss Jones, who is striving to improve it in every way that she can; so helpful a sub-committee as Mr. Charles M. Jones; and so appreciative a friend as Superintendent Morss, who holds this work at its true value and encourages it all that he can.

The garden has been put into first-class condition for the winter; new beds have been made for next season's planting; the old beds have been thoroughly fertilized with rich mould, and a number of extra plants already bedded in.

It is Miss Jones's intention to make the garden more useful than ever another year, and she hopes to have some photographs made showing some of the beds and the children at their work.

Respectfully submitted,

GEORGE E. DAVENPORT.

OTHER SCHOOL GARDENS.

The school garden is being recognized in a few places, besides those already mentioned, as a valuable educational adjunct. In the spring one will be started in Stoneham and another in East Braintree. The Superintendent of Schools in the latter place has invited some member of the School Garden Committee to give a talk on the subject in that place.

The Robert G. Shaw Garden will take a new lease of life in the spring, now that the city of Boston finds itself in such a financial condition, after a wearisome period, as to warrant the grading of the grounds.

A letter on the subject of school gardens was received from a very enthusiastic principal living in one of the Gulf States. In some way he came across a copy of the Transactions of this Society, and therein saw an account of a school garden, which kindled his enthusiasm to a high pitch. He solicited advice in regard to laying out a garden an acre in extent. As that was a little

ahead of anything the Committee had contemplated, only a moderate amount of advice could be transmitted to him.

Several school gardens have been established in Trenton, N.J. At various times our reports have been sent to Professor B. C. Gregory, the Superintendent of Schools in that place, and he has sent several letters concerning what has been done in gardening there, and has promised to send a printed report giving additional details of the work.

Two sample letters to him are herewith submitted. From the simple beginnings indicated therein great things may grow; and it is with some pride that we see the influence of the Massachusetts Horticultural Society extending in this particular line to distant places.

Trenton Public Schools,
School No. 8, December 15, 1897.

Professor B. C. Gregory:

Dear Sir: Last Arbor Day the children prepared three flower beds — two circular ones and one along the back fence. They dug out the clay and poor soil, and filled up with good soil brought from quite a distance. They then sowed seed and set out plants, which grew and were carefully looked after by the pupils. They enjoyed the flowers and took great pride in caring for them. There are three fine rose bushes, which will survive the winter, I think.

Respectfully,

M. M. Wright.

Trenton Public Schools,
School No. 15, Girard, December 17, 1897.

Professor B. C. Gregory:

Dear Sir: We started a garden, on either side of our school building, last spring, in which the children took a great deal of pride, and the plants were very much admired by all the neighborhood. We were a little afraid that our flowers would be interfered with during the summer, but, instead, the people in the neighborhood were careful that they should not be molested. We intend to extend the work in the spring again.

I am yours very respectfully,

Elizabeth Hughes.

CHILDREN'S HERBARIUMS.

It can be truly said that the children's herbariums exhibited November 26 and 27, 1897, considering the number and quality of the specimens, were the best ever placed on exhibition in Horticultural Hall.

More classes of plants were exhibited than at any previous exhibition, flowering plants leading with one thousand and twenty-nine specimens, and ferns coming next with two hundred and eleven specimens. These two classes were the largest ever seen here. Grasses, sedges, rushes, and mosses swelled the whole number to thirteen hundred and sixty-six specimens. For the exhibition of these mounts nearly all the table space in both halls was required.

The Nahant school collection was the most remarkable, both in point of numbers and the quality of the mounting. When the specimen was small by nature, many plants of the same species were artistically arranged on the sheet, so that different forms were shown and the sheet was well covered. A specimen two or three inches long looks lonesome on a sheet eleven by sixteen inches.

Among the collections that call for special mention were those of Lucy D. Ellis, Genevieve Doran, Vanessa Denton, William P. Bates, Marion C. Goward, Roscoe G. Knight, Arthur E. French, and Arthur C. Faxon. The last two exhibitors have shown nearly every common native plant, and many rare ones, during the five or six years they have exhibited.

Mr. Davenport's first prize of fifty native ferns, and the second of twenty-five, attracted marked attention. The former was won by Lucy D. Ellis, and the latter by Arthur E. French. Most fortunately, these two beautiful collections came into the possession of appreciative young botanists.

The attendance was much larger than at any previous exhibition, and in every way satisfactory.

It is remarkable that, notwithstanding the distribution of thousands of circulars and prize lists of the exhibition every year, advertising in three prominent Boston papers, and calling attention to the exhibition at teachers' conventions, so many people, teachers included, stumble as it were into the exhibition, declaring that they never knew anything about the matter before catching a glimpse of a seven-foot poster on each side of the outer door of this Hall.

PRIZES AND GRATUITIES AWARDED FOR SCHOOL GARDENS AND CHILDREN'S HERBARIUMS.

SCHOOL GARDENS.

George Putnam School, Roxbury, first prize	$15 00
Curtis School, Medford, second prize	10 00
Swan School, Medford, gratuity	15 00

CHILDREN'S HERBARIUMS.

Flowering Plants. — For one hundred and twenty-five specimens, first prize, Roscoe G. Knight	5 00
Second, Genevieve Doran	4 00
For one hundred specimens, first prize, Franklin Lewis	4 00
For seventy-five specimens, first prize, Carl M. True,	3 00
For fifty specimens, first prize, William P. Bates	2 00
Also first, Vanessa Denton	2 00
Gratuities: —	
Nahant School, for school collection of one hundred and eighty-four specimens	6 00
Marion C. Goward, for one hundred and twenty-five specimens	4 00
Arthur C. Faxon, for ninety-five specimens	4 00
Olive E. French, for fifty specimens	1 50
Arthur E. French, for forty-four additions	5 00
Ferns. — For twenty-five specimens, first prize, Marion C. Goward	4 00
For fifteen specimens, first prize, Roscoe G. Knight,	3 00
For ten specimens, first prize, Ada K. Wood	2 00
Second, Olive E. French	1 00
For five specimens, first prize, Clara Hathaway	75
Grasses.	
Gratuities: —	
Arthur E. French, for eight additions	2 00
Arthur C. Faxon, for two additions	50

SEDGES.

Gratuities: —

Arthur E. French, for two additions	$2 00
Arthur C. Faxon, for five additions	1 00

RUSHES.

Gratuity: —

Arthur C. Faxon, for eight specimens	2 00

LEAF SPRAYS. — For thirty-six sheets, first prize, J. Stanley Webb 3 00

Second, Katharine A. Dwyer	1 00

Gratuities: —

Arthur C. Faxon, for ten additions	1 00
Philip G. Clapp, for ten sheets	50
Total for Herbariums and Gardens	$104 25

The amount of money appropriated by the Society for the use of this Committee was		$250 00
Awarded for School Gardens	$40 00	
Awarded for Herbariums	64 25	
Suffolk Engraving Company (cuts)	10 05	
Printing	42 62	
Advertising	19 60	
Paper	6 21	
Expressage, posters, stamping, etc.	8 50	
		191 23
Balance unexpended		$58 77

HENRY L. CLAPP, Roxbury,
MRS. H. L. T. WOLCOTT, Dedham,
GEORGE E. DAVENPORT, Medford,
MISS KATHARINE W. HUSTON, Roxbury,
MRS. P. D. RICHARDS, West Medford,
WILLIAM P. RICH, Chelsea,
W. E. C. RICH, *Secretary*,
99 Moreland st., Roxbury, Mass.,

Committee on School Gardens and Children's Herbariums.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS

FOR THE YEAR 1897.

The year just about closing has been, as usual, quite gratifying to your Committee, for the reasons that the exhibitions all through the season have been very full, and an unusual interest has been manifested by a large number of new exhibitors. This is greatly to be commended, for the constant addition of new life to any working institution is desirable, since by these additions we come in contact with new and improved modes of cultivation, which are sometimes great improvements over the old methods, and add to our exhibitions an interest which they would not have had except by this new life which is constantly being added by the initiation of new members.

We are also pleased to note the unflagging interest of the gardeners in our shows, for without their hearty coöperation our shows would be utter failures. We are under great obligations to them for their industry and zeal, and we try to repay them, in part, by expending a portion of our appropriation for their comfort and enjoyment.

It is also pleasant to record the great success of the Mycological Club, an auxiliary to our Society, and the enthusiasm manifested by the members in making their shows of wild fungi as large and complete as possible. Their exhibitions have added very largely to the knowledge of the edible species of this class of vegetables, much to the gratification of the lovers of mushrooms.

Taking the Schedule of Prizes as the basis for our action, the halls, tables, etc., have been so arranged as best to bring into view the various collections at each exhibition, and the exhibitors have coöperated so well with your Committee that there has not been any friction or adverse comment on the allotment of space.

This is very gratifying when we take into consideration the very crowded and limited accommodations we have at some of our shows.

We are under still another obligation to our friend Jerome Jones, Esq., for the loan of three very large and elegant china vases for the display of chrysanthemums in November, thus giving us eight large vases to meet all the entries made for these particular prizes.

The exhibitions this year have been quite as numerous as during any former year, and yet at only two of them, the Spring and Chrysanthemum Shows, has any admittance fee been charged. At the end of this report will be found an account of the receipts derived from these exhibitions. These are not as much as your Committee would desire, and surely not nearly as much as it would expect with better accommodations. We are under obligations to the newspapers for copious reports of our shows, but we should be under much greater obligations if they would tell the public what to expect before the shows take place, thereby giving the people an inkling of what is to come off before the shows are all over.

The arrangements of plants and flowers at the different shows have been varied so as to produce the most pleasing effect as a whole, taking into consideration that none of your Committee knows what will be sent in till the contributions reach the hall.

The chairmen of other committees will tell you about the progress we are making in our noble art, and we trust their reports will be read with interest, pleasure, and profit by all our members.

Receipts at Spring Exhibition	$319 75
Receipts at Chrysanthemum Show	654 50
	$974 25

all of which is in the Treasury of the Society.

Respectfully submitted,

Jos. H. Woodford,
Chairman.

REPORT OF THE DELEGATE

TO THE

STATE BOARD OF AGRICULTURE

FOR THE YEAR 1897.

It was stated in a previous report that the work of the State Board of Agriculture was divided among sub-committees of the members. The work of the Committee on Gypsy Moth, Insects, and Birds would seem to have special interest for this Society. The present facilities for travel and transportation enable collectors to visit every habitable part of the globe in search for new species and varieties of fruits, flowers, vegetables, ornamental trees and shrubs, with the constant danger of bringing their insect enemies with them. Foreign countries have found it necessary to pass stringent laws requiring all nursery stock to be inspected before being planted or distributed.

Two insects which have proved most destructive in foreign countries have recently been introduced into this State,— the Gypsy Moth and the Brown-tailed Moth. The former was brought here by a Frenchman who, having some knowledge of entomology, thought that by cross-breeding he could produce a more hardy silk-worm than the common species. While carrying on his experiments some of the caterpillars escaped and soon became a serious pest in the neighborhood. He resided in the southern portion of Medford; his neighbors had small places with gardens of limited area containing the usual garden fruits. In 1889 the caterpillars appeared in such quantities as to defy all attempts to destroy them by individual effort. The shade trees in the streets were stripped of their foliage and the fences and the sides and roofs of the houses were covered with the caterpillars. They entered the houses, secreting themselves in the closets and in the beds. The citizens called a special town meeting and appropriated three hundred

dollars, and instructed the Road Commissioners to protect the shade trees. Without experience or the facilities for prosecuting the work, they made little progress. The residents of the infested and adjacent territory decided to petition the Legislature to assist in controlling and, if possible, exterminating this destructive pest. The Governor of the State resided in the infested territory, and in his annual message, January, 1890, called the attention of the Legislature to the matter. Petitions from the Selectmen of Medford and the adjoining towns, Arlington, Everett, Winchester, Stoneham, and Wakefield, from the city officials of Malden and Somerville, the State Board of Agriculture, and the Massachusetts Horticultural Society, were presented to the Legislature in January, 1890. The matter was referred to the Committee on Agriculture. The Committee visited the infested locality and reported that they saw walls of buildings and almost every tree covered with the egg clusters or nests.

The Legislature of 1890 enacted a law providing for the appointment of a commission to take charge of the work "to provide and carry into execution all possible measures to prevent the spread and secure the extermination of the *Ocneria dispar* or Gypsy Moth in this Commonwealth." The Legislature appropriated twenty-five thousand dollars, and the Governor appointed a commission consisting of three men, all residents of the infested territory. They commenced work immediately and killed large quantities of the caterpillars, paying special attention to the trees by the roadsides to prevent their being distributed by passing carriages. The Commission soon found that the money appropriated would not complete the work over the known infested territory, which was supposed to be about a mile and a half long and two-thirds of a mile wide, and the Legislature appropriated twenty-five thousand dollars more. The work of spraying was continued as long as the insect continued in the caterpillar state, and afterwards the eggs were destroyed.

In the spring of 1891 the Governor discharged the Commission and the Legislature passed an act placing the work of attempting "to prevent the spreading and to secure the extermination of the Gypsy Moth" in the hands of the State Board of Agriculture, and appropriated fifty thousand dollars to carry on the work.

The efforts of the Committee the first year were directed to destroying as many as possible of the insects where they were liable

to do the most injury; to cleaning the trees bordering the highways, and scouting to ascertain the outside limits of the area infested. During the year scattered colonies were found in thirty-one different towns and cities, bounded as follows: South by Boston and all the towns bordering on Massachusetts Bay to Beverly; on the east by Beverly, Danvers, and Reading; on the north by Bedford, Lexington, and Waltham, and on the west by Waltham and Watertown.

It was then determined that a line drawn on the outside limits of the above towns enclosed the infested territory, and from that time to the present only three colonies have been found outside the above-named limits. Two colonies have been found in Brookline and one in Lincoln.

It will not be understood that all the above territory was infested, but scattered colonies were found, diminishing in number in proportion to the facilities for transportation and the distance from the centre at Medford.

The plan of work pursued from the beginning has been to work from the outside towards the centre for extermination, and reduce the infested area, and, as far as means allowed, to reduce the numbers in the central portions, and to clean trees bordering highways and railroads.

The Committee have each year at the close of the season made a careful survey of the work done and to be done, and if the work was to be continued asked for the least amount of money to do the work absolutely necessary when viewed from an economic standpoint. These estimates have been reduced by the Legislature from one-third to one-half, thus causing a change of plans by which portions of the territory must be neglected; and so rapidly does this insect increase, that small colonies become large ones, and others that were greatly reduced, not only regain their former number and extent of ground occupied, but add largely to both.

As an illustration of the fecundity of this insect, I will mention one instance. While making an examination of one of the woodland colonies the past season, an oak tree ten inches in diameter, and from forty to fifty feet in height, was noticed as being thickly covered with nests, and the workmen were requested to count these nests as they destroyed them, and report the number. They reported two thousand and seventy. It has been found by the

examination of these nests that they contain on the average between five and six hundred eggs. This single tree was carrying through the winter a prospective increase of one million and thirty-five thousand caterpillars in one year. It has been found that ten full-grown caterpillars weigh an ounce, but allowing twenty to the ounce, the above number would weigh more than one and one-half tons. They are omnivorous, eating the foliage from every known tree, plant, and vegetable. They commence hatching about the twentieth of April, and continue until the middle of June, and feed until the last of July.

Strong colonies, if undisturbed, will kill most deciduous trees in two years, and evergreen trees in one year. They not only destroy the first foliage, but continue as the trees put forth new foliage to devour it until the last of July.

The difficulty, if not the impossibility, of controlling this insect by ordinary methods has been illustrated in many instances. General Lawrence, of Medford, stated before a committee of the Legislature that he spent more than three thousand dollars in a single season in his efforts to protect his own premises, but failed, and was obliged to call on the State employees for assistance.

Congress, at its last session, passed an act requiring the United States Department of Agriculture to make an investigation of the gypsy moth in Massachusetts. In accordance with that act, L. O. Howard, the head of the Entomological Division, has spent several weeks in making a thorough examination of the whole territory and the methods of work employed by the Committee for the extermination of this insect. His report is now in the publisher's hands, and will soon be issued, and may be relied upon as the judgment of one of the most expert economic entomologists in the country.

This war on the gypsy moth is not for the protection of Massachusetts alone, for if the work is discontinued, and they are allowed to increase along the highways and railroads, they must inevitably be carried into other States; and, judging from our experience in Massachusetts, we shall have the most dangerous and destructive national insect pest ever introduced into this country.

E. W. Wood,

Delegate.

REPORT

TO THE

STATE BOARD OF AGRICULTURE

FOR THE YEAR 1897.

By GEORGE CRUICKSHANKS, of Fitchburg.

In 1829 the Massachusetts Horticultural Society was organized to encourage the science and art of horticulture. How well it has fulfilled its mission may be seen at the exhibitions that are held at its beautiful hall on Tremont Street almost every Saturday during the year. Besides the Annual Spring, Rhododendron, Rose and Strawberry, Plant and Flower, Fruit and Vegetable, and Chrysanthemum Shows, prizes are offered every week during the summer and autumn months for the choicest products of the gardener's skill. The amount appropriated this year for premiums and gratuities was $8,100.

The year began with a course of Lectures and Discussions on the following subjects:

January 9. Tropical Horticulture, with Illustrations of the Principal Economic Plants of Hot Climates, by Professor George L. Goodale, Cambridge.

January 16. The Structure and Classification of Mushrooms, by Hollis Webster, Cambridge.

January 23. The Chrysanthemum; its Past, Present, and Future, by Edmund M. Wood, Wellesley.

January 30. Plant Beauty, by Henry T. Bailey, North Scituate.

February 13. Sweet Peas, by Rev. W. T. Hutchins, Indian Orchard.

February 20. Market Gardening, by T. Greiner, La Salle, N.Y.

February 27. Good Food from the Garden, by Miss Anna Barrows, Boston.

March 13. Horticulture in Canada, by Professor William Saunders, Ottawa, Canada.

March 20. Soils and Potting, by T. D. Hatfield, Wellesley.

March 27. The Spread of Plant Diseases; a consideration of some of the ways in which Parasitic Organisms are disseminated, by Dr. Erwin F. Smith, Washington, D.C.

The lectures and discussions are published in full in the Transactions of the Society, which are free to all the members of the Society.

The Spring Exhibition opened March 23 and continued four days. The Lower Hall contained a fine show of early vegetables and winter apples and pears. In the centre of the hall was a rich display of spring flowering greenhouse plants. In the Upper Hall were choice collections of spring flowering bulbs, which included the fragrant hyacinth, tulips, jonquils, narcissuses, and polyanthuses. There were excellent exhibits of perennials, cinerarias, cyclamens, and pansies, and a fine show of orchids.

The Rhododendron Show opened June 3 for two days. The rhododendrons and azaleas were very fine. Fine exhibits were made of carnations, foxgloves, oriental poppies, etc. There were large collections of native plants and an excellent display of orchids. One table was filled with a choice collection of vegetables. A tomato plant grafted on a potato and bearing potato tubers at the bottom and a tomato at the top attracted much attention.

The Rose and Strawberry Show was held June 22 and 23. The exceedingly cold and rainy spring was not favorable to the growth of the best quality of either fruit or flowers; consequently the display was not large and the quality was not as good as in some former years. In strawberries the Marshall took the lead in size and quality. Beautiful collections of orchids were shown; also a very fine specimen (trained) of Bougainvillea, large collections of rhododendrons, and an exhibit of seventy-two varieties of pæonies.

The Annual Exhibition of Plants and Flowers was held September 1 and 2. All lovers of flowers look forward to this annual plant and flower show. The Upper Hall was devoted to pot plants. Much credit is due the Committee of Arrangements for the taste

shown in arranging the pot plants in groups on the floor of the hall. All the stove, greenhouse, and foliage plants were in the best possible condition. The tanks of water plants near the entrance to the Upper Hall were very much admired. The Lower Hall was devoted to a splendid display of cut flowers. There was a very large show of dahlias on the tables and a solid bank on the platform at the end of the hall. Large collections of zinnias, marigolds, dianthuses, French cannas, native flowers, etc., were shown. The annual plant and flower show of 1897 was one of the best held by the Society.

The Annual Exhibition of Fruits and Vegetables began September 30, to hold two days. The show of apples was not as large as that of some years, but many fine specimens were on the tables, the Roxbury Russet, Washington Strawberry, and McIntosh Red being worthy of special mention. The show of pears was very fine, and many of the varieties were fully up to the high standard held by this Society. Peaches were excellent. Native grapes were good, notwithstanding the cold and rainy season. A novelty in the exhibition was a collection of seventeen varieties of edible nuts. The display of vegetables was abundant and of excellent quality. One long table was devoted to the squash family; another to potatoes, beets, onions, parsnips, and carrots. There was an interesting collection of culinary herbs, comprising twenty varieties, many of which are seldom seen at our exhibitions.

The Chrysanthemum Show began November 2, to continue four days. The Upper Hall was given up to the display of pot plants placed in groups on the floor. Here the gardener had a chance to show his taste in arranging for effect, each being allowed one hundred square feet. The plants were all well grown, and good taste was shown in the arrangement. The Lower Hall was devoted to the cut flowers on tables and in vases, every available space being filled with the finest display of the chrysanthemum ever shown in Horticultural Hall. Besides the chrysanthemums there was a fine show of orchids and carnations.

Respectfully submitted,

GEO. CRUICKSHANKS,

Inspector.

REPORT

OF THE

COMMITTEE ON THE LIBRARY

FOR THE YEAR 1897.

As usual, we find little to say about the affairs of the Library; the same report would suffice year after year with the alteration of a few words. The sums of money which we have received from the Society and from the income of the Stickney Fund have been expended in the usual way, and the increase of the Library by purchase has been about the same as in previous years. The Librarian's list will contain all the titles, and it is not necessary, therefore, to make especial mention of many. The most important of the works which we have been receiving part by part, Sargent's "Silva of North America," is now complete with the exception of two volumes, one of which will probably be at hand by the end of the year.

The books and pamphlets which we have obtained otherwise than by purchase have been as numerous as those we have bought; and we would make especial mention of a beautiful book presented by Mr. James Herbert Veitch, F.L.S., F.R.H.S., of the firm of James Veitch & Sons, descriptive of his journeys in the East and in Australia and New Zealand. The work is very valuable, not only for its text, but its illustrations, and is, moreover, a book which we could not easily have come by, since it was printed for private circulation only and not for distribution by the trade.

A year ago we stated that the regular force of the Library would probably be able to do the needful work upon the card catalogue of plates in the future. This expectation seems to have been well founded, and much of this work has been done in the past year. We regard this catalogue as a possession as valuable as it is unique; when we look at this great array of drawers

filled with cards, many of which contain three or four references, and remember that not one of these hundreds of thousands is included in Pritzel's Index, we see at a glance one proof of the completeness of our library and its accompanying key, which fully doubles its value. One thing more is lacking, which we hope may some day be supplied; namely, a similar index to subjects.

In regard to the suggestion made during the present year "that the Committee on the Library shall make a rule limiting the time during which books can be kept from the Library room," we wish to say that Regulations for the Library were adopted on the 13th of March, 1830; which regulations were revised in 1846 and again in 1861. In every case they included a rule fixing the time during which books taken from the Library might be kept. These rules provide that a copy shall be affixed to every book, and that this is done may be seen by any one who will take the trouble to examine.

For the Committee,

W. E. Endicott,

Chairman.

REPORT

OF THE

SECRETARY AND LIBRARIAN

FOR THE YEAR 1897.

In attempting to write a report of the work in this department during the year now closing, I am confronted with the same difficulty which has been encountered in former years — the fact that the work of one year is so similar to that of another, though never precisely the same in its details, that the report of one year must necessarily bear a strong general resemblance to that of another.

The Schedule of Prizes was, as I hoped when I presented my last report that it would be, ready and sent by mail with other documents to every member some days before the close of the year, and I trust that we may be able to do the same with the Schedule for 1898.

The publication, since my last report, of the List of Library Accessions in a separate pamphlet, as Part III. of the Transactions for 1895, affords a better opportunity than ever before to judge of the rapidity with which the Library is growing. The first publication of the full list of additions to the Library was in 1860, when it filled about two pages; in 1895 it filled sixty pages. Since my last report Part II. of the Transactions for 1896 has also been completed and published. As soon as I could see my way through these two publications, that of Part I. for 1897 was taken in hand. Four of the lecturers in the winter course having taken their papers home for revision, the first thing to be done was to recall these, and this was attempted early in June. One was received quite promptly; another, after three written requests, came to hand about the first of August, and a third a little later; but the fourth, notwithstanding many and urgent requests, was received only yesterday. Being one of the earliest in the course, it blocked the printing of all

the others; but the beginning of that part of the Transactions is now in the printer's hands and it will be completed as speedily as possible.

In my report as Librarian for 1895 I remarked that the work of binding the Agricultural Newspapers, which for the previous five years had been preserved as permanent additions to the Library, should not be much longer delayed. I am glad to be able now to report that during the present year sixty-two volumes of this class have been bound. Although this is not a great number, and though the cheapest bindings consistent with strength and durability were selected, the books were of so large size that the expense absorbed a considerable part of the library appropriation. The next heavy work in the way of binding is our large collection of Experiment Station Reports; this will be done as soon as time and funds permit.

The great interest in mushrooms the last two or three years induced the Library Committee to add to those already in the Library a selection of works on that subject, some of which are illustrated with colored plates. These books have afforded much gratification to members of the Society and others who are studying that class of plants.

Among other additions to the Library is a volume containing the anniversary addresses and other publications of the Society from its beginning in 1829 to 1837 inclusive. Although the Society already possessed copies of all these publications, interest is added to this volume by the fact that the pamphlets containing them were collected by the first President, General Dearborn, and that the volume has a title page, preface, and table of contents in his handwriting, the preface being signed by him and giving an account of the inception of the Society and the establishment by it of Mount Auburn Cemetery. There is also a copy of two circulars sent out to call the meetings which resulted in the formation of the Society, and a copy of the Order of Exercises at the Consecration of Mount Auburn. This unique volume was the gift of Edward C. R. Walker, whose lamented death on the 11th of October last has added to its value.

The work of completing imperfect sets has been steadily pursued. Our set of the Farmer's Magazine in ninety-three volumes, London, 1834–1881, has been completed by the fortunate purchase of the first nine volumes. In years past we have printed in connection

with the List of Library Accessions a list of books, etc., wanted, the last having been in 1883. It has every year since then been my desire to print another, but it has been omitted because the time required to prepare it would delay the publication of the Transactions. But with the publication of the Library Accessions in a separate pamphlet this objection no longer existed, and accordingly such a list was included in that pamphlet, and many of the books in it have already been procured, especially the publications of the United States Department of Agriculture, making our set of those publications complete with very few exceptions.

The extension of the usefulness of the Library among members of the Society and others has been kept constantly in mind, and a circular, intended to promote this object, signed by the President, was sent to every member of the Society and a large number of its correspondents, and still wider circulation was given to it by some of the leading horticultural and daily newspapers.

No special appropriation for the work on the Card Catalogue of Plates was made this year, but it has been carried on as far as possible by those regularly employed here.

One of the most vital portions of the Library, which makes us sharers in the horticultural progress of the day, is the periodicals supplied by the Society's appropriation, and by exchange for our own publications. These, which are ever growing in number, not only keep us informed as to the latest discoveries in horticulture, but when bound form a valuable, and not inconsiderable, permanent part of the annual accessions ; indeed, with other publications received by donation and exchange, they constitute the bulk of these annual additions. Another most valuable class of books is supplied by the Stickney Fund, but the interest of the Society in this fund expires with the present year, and it is much to be hoped that among the members and friends of the Society there may be found one possessing the means and disposition to establish a fund for the increase of the Library, which shall take the place of the Stickney Fund, and shall be a perpetual possession.

The fact that only three weeks after the organization of the Society a Committee on the Library was established to collect books, drawings, engravings, etc., relating to horticulture, shows the estimate attached by the founders of the Society to the importance of a library. After a time, however, the interest in the Library seemed to flag, but later, owing to the diligent

labors of the Library Committee and the gift of Mr. Stickney, it was revived, and the Library may now claim to be of fully equal importance with any department of the Society; indeed, as an educational influence, it may justly claim greater importance than any other department. The Library and the annual courses of lectures, only, can give the Society any claim to be considered a scientific institution. No more beautiful sight is afforded anywhere, or at any time, than the specimens of plants, flowers, fruits, and vegetables contributed in such perfection to the various exhibitions of this Society; but though they may excite in the beholders a desire to go and do likewise, in themselves they afford no information how to do it. The money spent in prizes and gratuities for these beautiful productions is doubtless productive of much good, but its permanent benefit, both to individuals and to the Society, is but small compared with that derived from a well stocked and carefully selected library, for that benefit is permanent and continually increasing.

The Library of the Royal Botanic Gardens, at Kew, is thought to be the best botanical library in the world, and there can be no better judge of such a library, both from a practical and scientific point of view, than Mr. George Nicholson, the Curator of the Gardens, author of the "Illustrated Dictionary of Gardening," and a Corresponding Member of this Society. When looking over our Library a few years ago, he exclaimed, "It is wonderful — it is wonderful — it is something that not only the State, but the whole nation, should be proud of!"

ROBERT MANNING,
Secretary and Librarian.

DECEMBER 18, 1897.

TREASURER'S REPORT

FOR THE YEAR 1897.

MASSACHUSETTS HORTICULTURAL SOCIETY *in account current to December 31, 1897, with* CHARLES E. RICHARDSON, *Treasurer.*

DR.

To amount paid on account of Library in 1897:			
For books, periodicals, and binding		$400 00	
From income of Stickney Fund for books	$733 54		
Less amount received from sale of duplicate books	50 00		
		683 54	
			$1,083 54
To amounts paid Interest on Funds for Prizes credited opposite			1,892 72
To amounts paid Interest on Loans			928 50
To Prizes awarded in 1896 paid in 1897 as follows:			
For Plants		$1,963 53	
" Flowers		2,528 19	
" Fruits		1,476 00	
" Vegetables		1,071 00	
" Gardens and Greenhouses		480 00	
" Hunnewell Prizes for Rhododendrons		105 00	
			7,623 72
To amount paid Committee on School Gardens and Children's Herbariums			191 23
" " Salaries, Secretary, Assistants, and Treasurer		$4,200 00	
" " Salaries of Committees		1,351 00	
" " Services on Transactions		107 00	
" " Committee of Arrangements		400 00	
" " Insurance		1,004 70	
" " Repairs		248 76	
" " Furniture and Exhibition Ware		657 34	
" " Heating		968 62	
" " Lighting		591 38	
" " Water Rates		354 00	
Amounts carried forward		$9,882 80	$11,719 71

Amounts brought forward	$9,882 80	$11,719 71
To amount paid Publication and Discussion	280 00	
" " Stationery, Printing, and Postage	1,370 30	
" " Taxes	2,756 00	
" " Legal Services	1,170 00	
" " Incidentals	679 73	
" " Labor, including Janitor's Salary	2,678 97	
" " Annual Exhibitions, Expenses	462 57	
" " H. H. Hunnewell	1,000 00	
" advanced to A. P. Loring, Executor	15,000 00	
		35,280 37
		$47,000 08
Balance of Cash, December 31, 1897		6,664 89
		$53,664 97

Cr.

By Balance of account rendered December 31, 1896			$6,600 61
Received from Building in 1897, viz.:			
Rents of Stores	$15,931 67		
" Halls	2,050 00		
		$17,981 67	
Received Income from Mount Auburn		4,682 64	
" Massachusetts State Bounty		600 00	
" Admissions and Assessments		1,132 00	
" Annual Exhibitions, Gross Receipts		974 25	
" Interest on Bonds	$1,075 00		
" " Bank Balance	44 58		
" " other sources	110 00		
		1,229 58	
" from sales of Transactions		2 00	
" " H. H. Hunnewell, prizes for 1896		32 00	
" " Heating		338 50	
" " Water Rates		199 00	
" Interest credited following Funds charged opposite:			
Samuel Appleton Fund	$50 00		
John A. Lowell Fund	50 00		
Theodore Lyman Fund	550 00		
Josiah Bradlee Fund	50 00		
Benjamin V. French Fund	25 00		
H. H. Hunnewell Fund	200 00		
W. J. Walker Fund	117 72		
Levi Whitcomb Fund	25 00		
Benjamin B. Davis Fund	25 00		
Marshall P. Wilder Fund	50 00		
John Lewis Russell Fund	50 00		
Josiah Stickney Fund, as agreed	700 00		
		1,892 72	
Notes Payable		18,000 00	
			47,064 36
			$53,664 97

CHAS. E. RICHARDSON,
Treasurer.

Approved:

H. H. Hunnewell,
A. Hemenway,
Francis H. Appleton,
} *Finance Committee.*

ASSETS AND LIABILITIES OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

DECEMBER 31, 1897.

ASSETS.

Real Estate		$250,000 00	
Stereotype Plates and copies of History		257 00	
Chicago, Burlington & Quincy R.R. Bonds		1,000 00	
Sinking Fund		23,872 50	
Kansas City, Clinton & Springfield R.R. Bonds		1,980 00	
Furniture and Exhibition Ware		7,650 75	
A. P. Loring, Executor		22,500 00	
Library		36,980 73	
Due from Tenants		2,641 79	
Cash		6,664 89	
			$353,547 66

LIABILITIES.

Mortgage		$1,000 00	
Notes Payable		18,000 00	
Josiah Stickney Fund, payable to Harvard College in 1899		12,000 00	
Unexpended balance of Josiah Stickney Fund		32 74	
Prize Funds invested in Building, viz.:			
Samuel Appleton Fund,	$1,000 00		
John A. Lowell "	1,000 00		
Theodore Lyman "	11,000 00		
Josiah Bradlee "	1,000 00		
Benjamin V. French "	500 00		
William J. Walker "	2,354 43		
Levi Whitcomb "	500 00		
Benjamin B. Davis "	500 00		
H. H. Hunnewell "	3,000 00		
	$20,854 43		
Prize Funds invested in Bonds:			
H. H. Hunnewell Fund,	$1,000 00		
Marshall P. Wilder "	1,000 00		
John Lewis Russell "	1,000 00		
	3,000 00		
		23,854 43	
Prizes for 1897, payable in 1898		8,100 00	
			62,987 17
Surplus			290,560 49
			$353,547 66

CHAS. E. RICHARDSON,
Treasurer.

Membership Account of the Massachusetts Horticultural Society, December 31, 1897.

Life Members per last report	554		
Added in 1897	15		
Commuted from Annual	6		
		575	
Deceased		26	
			549
Annual Members per last report	212		
Added in 1897	19		
		231	
Commuted to Life	6		
Deceased	2		
Resigned	5		
Dropped for non-payment, two years	6		
		19	
			212
Present Membership			761

INCOME FROM MEMBERSHIP.

15 new Life Members @ $30	$450 00
19 new Annual Members @ $10	190 00
6 commuted to Life @ $20	120 00
Annual Assessments	372 00
	$1,132 00

CHAS. E. RICHARDSON,
Treasurer.

Dr. *Massachusetts Horticultural Society in account with the Proprietors of the Cemetery of Mount Auburn.* Cr.

For Sales and Improvements within the Cemetery for the year ending December 31, 1897.

To cost of filling up and improving land at Mount Auburn for the year ending December 31, 1897:			By sales in January	$91 60
Vinca Path and Maple Avenue	$466 50		" " February	40 00
Yew and Fountain Avenues	2,027 62		" " March	1,470 00
	$2,494 12		" " April	760 00
One-quarter of $2,494.12 is	$623 53		" " May	2,504 77
Omitted, account, 1896	19 50		" " June	836 00
		$643 03	" " July	1,447 00
Balance due Mass. Horticultural Society		4,682 64	" " August	852 00
			" " September	1,520 00
			" " October	1,560 00
			" " November	9,823 33
			" " December	690 00
				$21,594 70
			Net amount received from Receiving Tomb	1,133 00
				$22,727 70
			Less grave repurchased	25 00
				$22,702 70
			Deduct for annual expenses	1,400 00
				$21,302 70
		$5,325 67	Mass. Horticultural Society ¼ part of $21,302.70	$5,325 67

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

December 31, 1897.

MASSACHUSETTS HORTICULTURAL SOCIETY

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following expenditures for grading new lands for sale during the year 1897 :

Vinca Path and Maple Avenue.

34 days, men	$76 50	
104 days, man and horse	390 00	
		$466 50

Yew and Fountain Avenues.

198¼ days, men	$446 06	
421¾ days, man and horse	1,581 56	
		2,027 62
		$2,494 12
One-fourth of $2,494.12 is		$623 53

Signed, JAMES C. SCORGIE,
Superintendent Mount Auburn Cemetery.

DECEMBER 31, 1897.

I certify the foregoing to be a true copy of improvements for the year 1897 rendered by the Superintendent.

H. B. MACKINTOSH,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1898.

President.

FRANCIS H. APPLETON, of Peabody.

Vice-Presidents.

CHARLES H. B. BRECK, of Brighton. BENJAMIN P. WARE, of Clifton.
WALTER HUNNEWELL, of Wellesley. SAMUEL HARTWELL, of Lincoln.

Treasurer and Superintendent of the Building.

CHARLES E. RICHARDSON, of Cambridge.

Secretary and Librarian.

ROBERT MANNING, of Salem.[1]

Professor of Botany and Vegetable Physiology.

BENJAMIN M. WATSON, of Jamaica Plain.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Delegate to the State Board of Agriculture.

E. W. WOOD, of West Newton.

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[1] Communications to the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

STANDING COMMITTEES.

Executive.

THE PRESIDENT, FRANCIS H. APPLETON, CHAIRMAN.

THE CHAIRMAN OF THE FINANCE COMMITTEE, H. H. HUNNEWELL, *Ex officio*.

WILLIAM C. STRONG.
WILLIAM H. SPOONER.
NATHANIEL T. KIDDER.
BENJAMIN C. CLARK.
WALTER HUNNEWELL.
CHARLES W. PARKER.
CHARLES F. CURTIS.

Finance.

H. HOLLIS HUNNEWELL, OF BOSTON, CHAIRMAN.

FRANCIS H. APPLETON.
AUGUSTUS HEMENWAY.

Lectures and Publication.

BENJAMIN M. WATSON, OF JAMAICA PLAIN, CHAIRMAN.

JAMES H. BOWDITCH.
AARON LOW.

Library.

WILLIAM E. ENDICOTT, OF CANTON, CHAIRMAN.

GEORGE W. HUMPHREY.
WALTER S. PARKER.
GEORGE E. DAVENPORT.
CHARLES W. SWAN.

Plants.

AZELL C. BOWDITCH, OF SOMERVILLE, CHAIRMAN.

JAMES COMLEY.
JAMES WHEELER.
WILLIAM J. MARTIN.
ARTHUR H. FEWKES.

Flowers.

J. WOODWARD MANNING, OF READING, CHAIRMAN.

MICHAEL H. NORTON.
KENNETH FINLAYSON.
FREDERICK S. DAVIS.
GEORGE E. DAVENPORT.

Fruits.

E. W. WOOD, OF WEST NEWTON, CHAIRMAN.

CHARLES F. CURTIS.
O. B. HADWEN.
WARREN FENNO.
SAMUEL HARTWELL.
J. WILLARD HILL.
SUMNER COOLIDGE.

Vegetables.

CHARLES N. BRACKETT, OF WATERTOWN, CHAIRMAN.

CEPHAS H. BRACKETT.
P. G. HANSON.
VARNUM FROST.
WARREN H. HEUSTIS.
WALTER RUSSELL.
AARON LOW.

Gardens.

PATRICK NORTON, of Dorchester, Chairman.
CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND ARRANGEMENTS, *Ex officiis.*
HENRY W. WILSON. JACKSON DAWSON.

For Establishing Prizes.

WILLIAM J. STEWART, of Winchester, Chairman.
CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis.*
MRS. P. D. RICHARDS.

Committee of Arrangements.

JOSEPH H. WOODFORD, of Boston, Chairman.
CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis.*
ROBERT FARQUHAR.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is incorrect in any particular, will confer a favor by promptly communicating to the Secretary any needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus †.

Adams, Luther, Newton.
Alger, Rev. R. F., Becket.
Allen, Hon. Charles H., Lowell.
Ames, Frank M., Canton.
Ames, George, Boston.
Ames, Oakes, 2d, North Easton.
Ames, Preston Adams, Boston.
Amory, Charles, Boston.
Amory, Frederick, Boston.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D.C.
Andros, Milton, San Francisco, Cal.
Appleton, Edward, Wakefield.
Appleton, Francis H., Peabody.
Appleton, William S., Boston.
Ash, John, Pomfret Centre, Conn.
Atkins, Edwin F., Belmont.

Bailey, Jason S., West Roxbury.
Bancroft, John C., Boston.
Banfield, Francis L., M.D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Boston.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
† Barney, Levi C., Boston.
Barratt, James, Ballard Vale.
Barrett, Edwin S., Concord.
Barry, John Marshall, Boston.
Barry, William C., Rochester, N.Y.
Bartlett, Edmund, Newburyport.
Beal, Leander, Boston.
Becker, Frederick C., Cambridge.
Beckford, Daniel R., Jr., Jamaica Plain.
Beebe, E. Pierson, Boston.
Beebe, Franklin H., Boston.
Beebe, J. Arthur, Boston.
Berry, James, Brookline.
Blake, Francis, Weston.
Blake, Frederick A., Rochdale.
Blakemore, John E., Roslindale.
Blanchard, John W., Dorchester.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Boston.
Boardman, Samuel M., Hyde Park.
Bôcher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bosler, Frank C., Carlisle, Penn.
Bowditch, Azell C., Somerville.
Bowditch, Charles P., Jamaica Plain.
Bowditch, Ernest W., Milton.
Bowditch, James H., Brookline.
Bowditch, Nathaniel I., Framingham.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Brighton.
Brackett, Charles N., Watertown.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.

Briggs, William S., Lincoln.
Brigham, William T., Honolulu, Hawaii.
Brooks, J. Henry, Milton.
Brown, Alfred S., Jamaica Plain.
Brown, Charles E., Yarmouth, N.S.
Brown, Edward J., Weston.
Brown, George Barnard, Brookline.
Brown, John T., Newburyport.
Bullard, John R., Dedham.
Burlen, William H., Boston.
Burnett, Harry, Southborough.
Burr, Matthew H., Hingham.
Buswell, Frank E., Brooklyn, N.Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.

Cabot, Edward C., Brookline.
†Cadness, John, Flushing, N.Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Cameron, Robert, Cambridge.
Campbell, Francis, Cambridge.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carr, Hon. John, Roxbury.
Carter, Charles N., Boston.
Carter, Miss Maria E., Woburn.
Cartwright, George, Dedham.
Chadbourne, Marshall W., Mount Auburn.
Chaffin, John C., Newton.
Chamberlain, Chauncy W., Boston.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Dedham.
Chase, William M., Dorchester.
Cheney, Amos P., Natick.
Cheney, Mrs. Elizabeth S., Wellesley.
Childs, Nathaniel R., Boston.
Choate, Charles F., Southborough.
Christie, William, Newton.
Claflin, Hon. William, Newtonville.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, B. Preston, Cohasset.
Clark, Miss Eleanor J., Pomfret Centre, Conn.
Clark, J. Warren, Rockville.
Clarke, Miss Cora H., Boston.
Cleary, Lawrence, West Roxbury.
Clough, Micajah Pratt, Lynn.
Cobb, Albert A., Brookline.
Cobb, John C., Milton.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, South Lincoln.
Collamore, Miss Helen, Boston.
Converse, Elisha S., Malden.
Converse, Parker L., Woburn.
Coolidge, Joshua, Mount Auburn.
Cottle, Henry C., Boston.
Cowing, Walter H., West Roxbury.
Cox, Thomas A., Dorchester.
Coy, Samuel I., Boston.
Crawford, Dr. Sarah M., Roxbury.
Crocker, Miss S. H., Boston.
Crosby, George E., West Medford.
†Crowell, Randall H., Chelsea.
Cummings, Hon. John, Woburn.
Curtis, Charles F., Jamaica Plain.
Cushing, Livingston, Weston.
Cushing, Robert M., Boston.

†Daggett, Henry C., Boston.
Dana, Charles B., Wellesley.
Davenport, Albert M., Watertown.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.
Davenport, Henry, New York.
Davis, John, Lowell.
Dawson, Jackson, Jamaica Plain.
Day, William F., Roxbury.
Dee, Thomas W., Mount Auburn.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dickerman, George H., Somerville.
Dike, Charles C., Stoneham.
Doliber, Thomas, Brookline.

Donald, William, West Roxbury.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Dowse, William B. H., West Newton.
Draper, Hon. Eben S., Hopedale.
Dreer, William F., Philadelphia, Pa.
Dumaresq, Herbert, Chestnut Hill.
Dunlap, James H., Nashua, N.H.
Durant, William, Boston.
Durfee, George B., Fall River.
Dutcher, Frank J., Hopedale.

Eaton, Horace, Cambridge.
Edgar, William W., Waverly.
Eldredge, H. Fisher, Boston.
†Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Elliot, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William, Jr., Boston.
Endicott, William E., Canton.
Estabrook, Arthur F., Boston.
Everett, William, Dorchester.
Ewell, Warren, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Pittsburgh, Pa.
Farlow, Lewis H., Newton.
Farnsworth, Mrs. William, Dedham.
Farquhar, James F. M., Roslindale.
Farquhar, John K. M. L., Roxbury.
Farquhar, Robert, Boston.
Faxon, John, Quincy.
Fewkes, Arthur H., Newton Highlands.
Finlayson, Kenneth, Brookline.
Fisher, James, Roxbury.
Flagg, Augustus, Boston.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.
Flint, David B., Boston.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, J. D. Williams, Boston.
French, Jonathan, Boston.
French, S. Waldo, Jamaica Plain.
French, W. Clifford, Newton.
Frohock, Roscoe R., Malden.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
Gardner, George A., Boston.
Gardner, George P., Boston.
†Gardner, Henry N., Mount Auburn.
Gardner, John L., Brookline.
Gibbs, Wolcott, M.D., Newport, R.I.
Gill, George B., Medford.
Gillard, William, Harrison Square, Dorchester.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Reading.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Joseph, Sharon.
Goddard, Mrs. Mary T., Newton.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
†Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Kendall Green.
Gray, James, Wellesley.
Gregory, Hon. James J. H., Marblehead.
Greig, George, Toronto, Ontario.
Grey, Benjamin, Malden.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hale, James O., Byfield.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., M.D., Warren, R.I.
Hall, Osborn B., Malden.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G., New London, Conn.
Hammond, George W., Boston.
Hanson, P. G., Woburn.
†Harding, George W., Arlington.
Harding, Louis B., Stamford, Conn.

Hardy, F. D., Cambridgeport.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A.M., Keene, N.H.
Harwood, George Fred, Newton.
Haskell, John C., Lynn.
Hastings, Levi W., Brookline.
Hatch, Mrs. C. S., North Cambridge.
Hatch, Edward, Boston.
Hathaway, Seth W., Marblehead.
Hawken, Mrs. Thomas, Rockland, Me.
†Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Hews, Albert H., North Cambridge.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mount Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Portsmouth, N.H.
Hoitt, Hon. Charles W., Nashua, N.H.
Hollingsworth, Amor L., Milton.
Hollis, George W., Grantville.
Holmes, Edward J., Boston.
Holt, Mrs. Stephen A., Winchester.
Horner, Mrs. Charlotte N. S., Georgetown.
Horsford, Miss Kate, Cambridge.
Hovey, Charles H., South Pasadena, Cal.
Hovey, Stillman S., Woburn.
Howard, Joseph W., Somerville.
Hubbard, Charles T., Weston.
Hubbard, Charles Wells, Weston.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
†Hunt, Franklin, Boston.
Hunt, William H., Concord.
Hyde, James F. C., Newton Highlands.

Jack, John George, Jamaica Plain.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Dorchester.
Janvrin, William S., Revere.
Jenks, Charles W., Bedford.
Johnson, J. Frank, Boston.
Jones, Jerome, Brookline.
Jose, Edwin H., Cambridgeport.
Joyce, Mrs. E. S., Medford.

Kakas, Edward, West Medford.
Kellen, William V., Marion.
Kelly, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
†Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennedy, George G., M.D., Roxbury.
Kent, John, Brookline.
†Keyes, E. W., Denver, Col.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
†Kimball, A. P., Boston.
King, Franklin, Dorchester.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Knapp, Walter H., Newtonville.

Lancaster, Charles B., Newton.
Lawrence, Amory A., Boston.
Lawrence, Amos A., Boston.
Lawrence, James, Groton.
Lawrence, John, Groton.
Learned, Charles A., Arlington.
Lee, Charles J., Dorchester.
Lee, Daniel D., Jamaica Plain.
Lee, Francis H., Salem.
Lee, Henry, Boston.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, Charlestown.

Leuchars, Robert B., Brookline.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Swampscott.
Loftus, John P., Dorchester.
Loomis, Elihu G., Bedford.
Lothrop, William S. H., Boston.
†Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, William, Boston.
Lunt, William W., Hingham.
Lyman, George H., Wareham.
Lyon, Henry, M.D., Charlestown.

†Mahoney, John, Boston.
Mallet, E. B., Jr., Freeport, Maine.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, J. Woodward, Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Chelsea.
Mason, Col. Frederick, Taunton.
Matthews, Nathan, Boston.
May, F. W. G., Boston.
McCarty, Timothy, Providence, R.I.
McClure, John, Revere.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Herbert, Weston.
Merriam, M. H., Lexington.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Washington, D.C.
Minton, James, Boston.
Mitton, Edward J., Brookline.
Mixter, George, Boston.
Monteith, David, Dedham.
Montgomery, Alexander, Natick.
Moore, John H., Concord.
Morgan, George H., New York, N.Y.
†Morse, Samuel F., Boston.
Moseley, Charles H., Dorchester.
Mudge, George A., Portsmouth, N.H.
Murphy, William Bowen, Boston.

Nevins, David, Framingham.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, George A., Dedham.
Norton, Charles W., Allston.
Norton, Edward E., Boston.

Oakman, Hiram A., North Marshfield.
Olmsted, John Charles, Brookline.

Packer, Charles H., Boston.
Paige, Clifton H., Mattapan.
Palmer, Julius A., Jr., Boston.
Parker, Augustus, Roxbury.
Parker, Charles W., Boston.
Partridge, Horace, North Cambridge.
Patten, Marcellus A., Tewksbury.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody, John E., Boston.
Peck, O. H., Denver, Col.
Peck, William G., Arlington.
Peirce, Silas, Boston.
Perkins, Edward N., Jamaica Plain.
†Perry, George W., Malden.
Philbrick, William D., Newton Centre.
Pierce, Dean, Brookline.
Pierce, George Francis, Dorchester.
Poor, John R., Boston.
Porter, James C., Wollaston.
Potter, Joseph S., Fredericksburg, Va.
Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Pray, Dr. Mark W., Boston.
Prescott, Eben C., New York.
Pringle, Cyrus G., Charlotte, Vt.

Prouty, Gardner, Littleton.
Putnam, Joshua H., Newton Centre.

Quinby, Hosea M., M.D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Miss Elizabeth L., Newton Highlands.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, Hon. Joseph G., Franklin.
Raymond, Walter, Boston.
Read, Charles A., Manchester.
Reardon, John B., Boston.
Reed, George W., Boston.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Cambridge.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Melrose Highlands.
Robinson, John, Salem.
Robinson, Joseph B., Dorchester.
Robinson, Warren J., Somerville.
Ross, Henry, Newtonville.
Ross, Waldo O., Boston.
Ruddick, William H., M.D., South Boston.
Russell, George, Woburn.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Boston.
Sanford, Oliver S., Hyde Park.
Sargent, Charles S., Brookline.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Boston.
Scorgie, James C., Cambridge.
†Scott, Charles, Newton.
Sears, Miss Clara E., Boston.
Sears, J. Montgomery, Boston.
Shaw, Christopher C., Milford, N.H.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Siebrecht, H. A., New Rochelle, N.Y.
Simpkins, Hon. John, Yarmouthport.
Skinner, Francis, Boston.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Jamaica Plain.
Smith, Charles S., Lincoln.
Smith, Edward N., San Francisco, Cal.
Smith, George O., Boston.
Smith, Thomas Page, Waltham.
Snow, Eugene A., Melrose.
Souther, Charles H., Jamaica Plain.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Sprague, Hon. Charles F., Brookline.
Sprague, Isaac, Wellesley Hills.
Springall, George, Malden.
Stearns, Frank W., Newton.
Stedman, Henry R., M.D., Roslindale.
Stewart, William J., Winchester.
Stone, Charles W., Boston.
Stone, Prof. George E., Amherst.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Sturgis, Russell, Manchester.
Sturtevant, E. Lewis, M.D., South Framingham.
Swain, Charles E., Roxbury.
Sweet, Everell F., Malden.

Taft, John B., Cambridge.
Talbot, Mrs. I. Tisdale, Boston.
Tarbell, George G., M.D., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Tenney, C. H., Methuen.
Thompson, Leonard, Woburn.
Thurlow, Thomas C., West Newbury.
Tilton, Stephen W., Roxbury.

Todd, John, Hingham.
Tolman, Benjamin, Concord.
Toppan, Roland W., Malden.
Torrey, Everett, Charlestown.
Trepess, Samuel J., Glencove, L.I., N.Y.
†Turner, John M., Dorchester.
Turner, Roswell W., Boston.

Vander-Woerd, Charles, Waltham.
Vinal, Miss Mary L., Somerville.

Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Waldo, C. Sidney, Jamaica Plain.
Wales, George O., Braintree.
Walker, Miss Mary S., Waltham.
Walley, Mrs. W. P., Boston.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Ware, Benjamin P., Clifton.
Ware, Miss Mary L., Boston.
Washburn, Andrew, Hyde Park.
Watson, Benjamin M., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Webster, Hollis, Cambridge.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Newport, R.I.
Weld, Richard H., Boston.
West, Mrs. Maria L., Neponset.
Weston, Seth, Revere.
Wheeler, Frank, Concord.
Wheeler, Wilfred, Concord.
Wheelwright, A. C., Brookline.
Whitcomb, William B., Medford.
White, Francis A., Brookline.
White, Joseph H., Brookline.
Whitney, Arthur E., Winchester.
Whitney, Ellerton P., Milton.
Whittier, Hon. Charles, Roxbury.
Whittier, George E., Groton.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R.I.
Willcutt, Levi L., West Roxbury.
Williams, Aaron D., Boston.
Williams, Benjamin B., Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wright, John G., Brookline.
Wyman, Oliver B., Shrewsbury.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Adams, Henry Saxton, Dorchester.
Allen, Charles L., Floral Park, N.Y.
Alles, William H., Hyde Park.
Anderson, George M., Milton.
Arnold, Mrs. Anna E., Roxbury.
Arnold, Miss Sarah L., Newton Centre.
Atkinson, Edward, Brookline.

Badlam, William H., Dorchester.
Barker, John G., Melrose.
Benedict, Washington G., Boston.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southborough.
Bird, John L., Dorchester.
Blake, Edward D., Boston.
Bliss, Benjamin K., East Bridgewater.
Blomberg, Carl, North Easton.
Bock, William A., North Cambridge.
Bolles, Matthew, Boston.
Bolles, William P., M.D., Roxbury.
Bouvé, Lander M., Brookline.
Boyden, Clarence F., Taunton.
Braman, George H., Newton.
Breck, Charles H., Newton.
Breck, Charles H. B., Brighton.
Brooks, George, Brookline.
Brown, David H., West Medford.
Butler, Edward, Wellesley.

Carpenter, Frank O., West Roxbury.
Carroll, James T., Chelsea.
Carter, Mrs. Sarah D. J., Wilmington.
Cary, Miss Alice B., Lexington.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Chase, Philip A., Lynn.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Roxbury.
Clark, John Spencer, Boston.
Clark, John W., North Hadley.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Clarke, Frederick E., Lawrence.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, David H., Jr., Boston.
Coolidge, Sumner, Mount Auburn.
Cotter, Lawrence, Dorchester.
Cotting, Charles U., Boston.
Councilman, Prof. W. T., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston.
Curtis, Louville, Tyngsborough.

Damon, Frederick W., Arlington.
Davis, Frederick, Boston.
Davis, Frederick S., West Roxbury.
Davis, Thomas M., Cambridgeport.
Dawson, Charles Jackson, Jamaica Plain.
Dimick, Orlendo W., Watertown.
Dolbear, Mrs. Alice J., College Hill.
Doran, Enoch E., Brookline.
Dorr, George B., Boston.

Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eaton, Warren E., Reading.
Endicott, Miss Charlotte M., Canton.
Ewell, Marshall F., Marshfield Hills.

Faxon, Edwin, Jamaica Plain.
Felton, Arthur W., West Newton.
Fenno, Warren, Revere.
Fisher, Sewall, Framingham.
Fitzgerald, Desmond, Brookline.
Fletcher, Fred W., Auburndale.
Forbes, William H., Jamaica Plain.
French, Charles G., Utica, N.Y.
Frost, Artemas, Belmont.
Frost, George, West Newton.
Frost, Varnum, Arlington.
Fuller, T. Otis, Needham.

Gibbon, Mrs. James A., Brookline.
Gill, Mrs. E. M., Medford.
Gilman, Hon. Virgil C., Nashua, N.H.
Grant, Charles E., Concord.
Grew, Henry Sturgis, Boston.
Grey, Thomas J., Chelsea.

Hall, Charles H., M.D., Boston.
Hall, Stacy, Boston.
Hall, William T., Revere.
Hallstram, Charles W., Boston.
Hargraves, William J., Jamaica Plain.
Harris, Frederick L., Wellesley.
Harrison, Thomas, Melrose Highlands.
Hartwell, Samuel, Lincoln.
Hatfield, T. D., Wellesley.
Henshaw, Samuel, West Brighton, N.Y.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hewett, Miss Mary C., Canton.
Hill, J. Willard, Belmont.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Horton, Herbert A., Brookline.
Houghton, George S., West Newton.
Hubbard, F. Tracey, Cambridge.
Huston, Miss Katherine W., Jamaica Plain.

Ireland, Robert D., Winthrop.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.
Jones, Dr. Mary E., Boston.

Keith, Miss Mary R., Washington, D.C.
Kemp, William S., Brookline.
Kenrick, Miss Anna C., Newton.

Lancaster, Mrs. E. M., Roxbury.
Lawrence, Henry S., Roxbury.
Lee, William W., Northampton.
Lincoln, Miss Agnes W., Medford.
Lomax, George H., Somerville.
Lombard, Richard T., Wayland.
Loring, Charles G., Boston.
Loring, John A., North Andover.
Loring, William C., Beverly.
Lothrop, Thornton K., Boston.
Low, Hon. Aaron, Hingham.
Lowell, John, Newton.

Manda, W. A., South Orange, N.J.
Manning, A. Chandler, Reading.
Martin, William J., Milton.
Masten, Cornelius E., Roxbury.
McDowell, Mrs. Mary, Cambridge.
McLaren, Anthony, Westwood.
McMullen, Edgar, Boston.
Meriam, Horatio C., D.M.D., Salem.
Merrill, John J., Roxbury.
Milman, William, Roxbury.
Moody, Abner J., Boston.
Moore, George D., Arlington.
Moseley, Frederick Strong, West Newbury.
Munson, Prof. W. M., Orono, Me.
Mutch, John, Brookline.

Newton, John F., Roxbury.
Nicholson, William, Framingham.

Norton, Michael H., Boston.
Norton, Patrick, Boston.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Park, William P., West Boxford.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Peirce, George H., Concord Junction.
Petremant, Robert, Brooklyn, N.Y.
Pickman, Dudley L., Boston.
Pigott, Thomas E., Winthrop.
Plimpton, Willard P., West Newton.
Power, Charles J., South Framingham.
Prichard, Joseph V., Boston.
Purdie, George A., Wellesley Hills.

Rea, Charles H., Norwood.
Rea, Frederic J., Norwood.
Rich, Miss Ruth G., Dorchester.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, Mrs. P. D., West Medford.
Robbins, Oliver R., Weston.
Robinson, Walter A., Arlington.
Ross, Charles W., Newtonville.
Ross, Henry Wilson, Newtonville.
Rothwell, James E., Brookline.

Sander, Charles, Brookline.
Saunders, Miss Mary T., Salem.
Sawtelle, J. M., Fitchburg.
Scott, Augustus E., Lexington.
Scudder, Samuel H., Cambridge.
Searles, E. F., Methuen.
Seaver, Edwin P., LL.D., Waban.
Sharples, Stephen P., Cambridge.
Shaw, Hon. Edward P., Newburyport.
Sheppard, Edwin, Lowell.
Smith, Archibald, Somerville.
Southworth, Edward, Quincy.
Squire, Miss Esther A., North Cambridge.
Stearns, Mrs. Charles A., East Watertown.
Stearns, Charles H., Brookline.
Stevens, Mrs. Mary L., Cambridge.
Stevens, Miss Mary O., North Andover.
Stone, Joshua C., Watertown.
Storer, Charles, Providence, R.I.
Story, Miss Sarah W., Brighton.
Swan, Charles W., M.D., Brookline.

Tailby, Joseph, Wellesley.
Teele, William H., West Acton.
Terry, Rev. Calvin, North Weymouth.
Toby, Rufus T., Roxbury.
Travis, Charles B., Brighton.
Tyndale, Theodore H., Brookline.

Vaughan, J. C., Chicago, Ill.

Walsh, Michael H., Wood's Holl.
Warren, Samuel H., Weston.
Welch, Patrick, Dorchester.
Wells, Benjamin T., Newtonville.
Westwood, Thomas H., Jamaica Plain.
Wheeler, Henry A., Newtonville.
Wheeler, James, Brookline.
White, Maurice P., Roxbury.
White, W. Henry, Lowell.
Whitney, Joseph, Cambridgeport.
Whiton, Hon. Starkes, Hingham Centre.
Wilkie, Edward A., Newtonville.
Winter, William C., Mansfield.
Wolcott, Mrs. H. L. T., Dedham.
Wood, Mrs. Anna D., West Newton.
Wood, Elijah A., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Boston.
Woods, Henry F., Boston.
Worthington, Roland, Roxbury.

Young, Arthur W., Hingham.
Young, Charles S., Newton Centre.
Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXII.

Life Members.

The payment of thirty dollars shall constitute a Life Membership and exempt the member from all future assessments, and any Annual Member, having paid all dues, may become a Life Member by the payment of twenty dollars in addition thereto.

Annual Membership.

Every Annual Member, before he receives his diploma or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIII.

Withdrawal or Discontinuance of Membership.

Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him. Any member who shall neglect for the space of two years to pay his annual assessment, after due notice from the Treasurer, shall cease to be a member. The Treasurer shall give notice of such withdrawals or discontinuances to the Secretary, who shall erase such members' names from the list.

The attention of Annual Members is particularly called to Section XXIII.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851.

Hon. George S. Boutwell, Groton.
H. W. S. Cleveland, Chicago, Ill.
Major L. A. Huguet-Latour, M.P., Montreal, Canada.
Joseph Jefferson, Buzzard's Bay.
Joseph Maxwell, Rio Janeiro, Brazil.
Donald G. Mitchell, New Haven, Conn.
Hon. J. Sterling Morton, Ex-Secretary of Agriculture, Washington, D.C
Baron R. Von Osten Sacken, Heidelberg, Germany.
Samuel B. Parsons, Flushing, N.Y.
George W. Smith, Boston.
Hon. James Wilson, Secretary of Agriculture, Washington, D.C.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829, S. Reynolds, M.D., 1832, *and* Francis Summerest (or Summerer), 1833.

Édouard André, Editor in Chief of the Revue Horticole, Paris, France.

Professor L. H. Bailey, Horticultural Department, Cornell University, Ithaca, N.Y.

Charles Baltet, Président de la Société Horticole, Vigneronne, et Forestière de l'Aube, Troyes, France.

Napoleon Baumann, Bolwiller, Alsace.

D. W. Beadle, 303 Crawford St., Toronto, Ontario.

Professor William J. Beal, Agricultural College, Michigan.

Prosper J. Berckmans, Ex-President of the American Pomological Society, Augusta, Ga.

Charles E. Bessey, Ph.D., Professor of Botany in the Industrial College of the University of Nebraska, Lincoln.

Dr. Ch. Bolle, Berlin, Prussia.

John Croumbie Brown, LL.D., Haddington, Scotland.

Professor J. L. Budd, Secretary of the Iowa Horticultural Society, Ames.

William Bull, Chelsea, England.

Alexander Burton, United States Consul at Cadiz, Spain, Philadelphia.

Isidor Bush, Bushberg, Jefferson Co., Mo.

George W. Campbell, Ex-President of the Ohio State Horticultural Society, Delaware, O.

Maxime Cornu, Director of the Jardin des Plantes, Paris, France.

Benjamin E. Cotting, M.D., Boston.

Daniel T. Curtis, Dorchester.

Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.

Malcolm Dunn, Dalkeith, Scotland.

W. T. Thiselton Dyer, C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew, England.

Parker Earle, President of the American Horticultural Society, Roswell, N.M.

George Ellwanger, Rochester, N.Y.

Henry John Elwes, F.L.S., F.Z.S., Colesborn, Andoversford, Gloucestershire, England.

William G. Farlow, M.D., Professor of Cryptogamic Botany, Harvard University, Cambridge.

B. E. Fernow, Chief of the Division of Forestry, Department of Agriculture, Washington, D.C.

Hon. Robert W. Furnas, Ex-President of the Nebraska State Horticultural Society, Brownville.

Charles A. Goessmann, Ph.D., LL.D., Chemist of the Hatch Experiment Station of the Massachusetts Agricultural College, Amherst.

George L. Goodale, M.D., Professor of Botany, Harvard University, Cambridge.

Obadiah B. Hadwen, President of the Worcester County Horticultural Society, Worcester.

Professor Byron D. Halsted, Botanist and Horticulturist at the New Jersey Agricultural Experiment Station, New Brunswick, N.J.

J. H. Hart, Superintendent of the Botanic Garden, Trinidad.

Dr. F. M. Hexamer, Editor American Agriculturist, New York.

J. W. Hoffmann, Colored State University, Orangeburg, S.C.

J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.

The Very Rev. S. Reynolds Hole, D.D., Dean of Rochester, Rochester, England.

Sir Joseph Hooker, K.C.S.I., The Camp, Sunningdale, England.

Josiah Hoopes, West Chester, Pa.

George Husmann, Napa, Cal.

William J. Johnson, M.D., Fort Gaines, Ga.

Charles Joly, Vice-President of the Société Nationale d'Horticulture de France, Paris.

Sir George King, Superintendent of the Royal Botanic Garden, Calcutta.

Professor William R. Lazenby, Secretary of the Agricultural Experiment Station, Columbus, O.

Max Leichtlin, Baden-Baden, Germany.

G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.

Victor Lemoine, Nancy, France.

J. Linden, Ghent, Belgium.

T. T. Lyon, Honorary President of the Michigan Horticultural Society, South Haven.

Dr. Peter MacOwan, F.L.S., Director of the Botanic Garden, Cape Town, Africa.

Dr. Maxwell T. Masters, Editor of the Gardeners' Chronicle, London.

George Maw, Benthal, Kinley, Surrey, England.

T. C. Maxwell, Geneva, N.Y.

Thomas Meehan, Germantown, Pa.

Dr. Charles Mohr, Mobile, Ala.

Dr. Daniel Morris, C.M.G., D.Sc., M.A., F.L.S., Assistant Director of the Royal Botanic Gardens, Kew, England.

Ch. Naudin, Antibes, France.

George Nicholson, Curator of the Royal Botanic Gardens, Kew, England.

William Paul, Waltham Cross, London, N.

Professor D. P. Penhallow, Director of the Botanic Garden, Montreal, Canada.

Henry Probasco, Cincinnati, O.

P. T. Quinn, Newark, N.J.

Cavalière Enrico Ragusa, Palermo, Sicily.

D. Redmond, Ocean Springs, Miss.

S. Reynolds, M.D., Schenectady, N.Y.

William Robinson, Editor of The Garden, London.

Edgar Sanders, Chicago, Ill.

William Saunders, Department of Agriculture, Washington, D.C.

William R. Smith, Curator of the Botanic Garden, Washington, D.C.

Robert W. Starr, Port William, N.S.

Dr. Joseph Stayman, Leavenworth, Kan.

Francis Summerest.

William Sumner, Pomaria, S.C.

William Trelease, Director of the Missouri Botanic Garden, St. Louis.

Dr. Melchior Treub, Director of the Botanic Garden, Buitenzorg, Java.

H. J. Veitch, Chelsea, England.

Henry L. de Vilmorin, Secretary of the Société Nationale d'Agriculture de France, Paris.

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EXPERIMENT STATION REPORTS WANTED.

The Massachusetts Horticultural Society is endeavoring to collect complete sets of the Bulletins and other publications of all the Agricultural Experiment Stations in the United States and Canada. Those named below are wanting, and any person having a spare copy will confer a favor by addressing the Librarian of the Society, Horticultural Hall, No. 101 Tremont Street, Boston.

Alabama (Ag. and Mech. College Station). — Bulletins 4–6 (1884), 7–10 and 1–4 (1885), 5–9 (1886), and Bulletin 42. 7th Annual Report, for 1894.

Alabama (Canebrake Station). — All Annual Reports later than the 3d, for 1890.

Arizona. — 4th Annual Report, for 1893.

Arkansas. — Bulletin 1. All Annual Reports later than the 4th, for 1891, except the 8th, for 1895.

California. — Bulletins 32, 1878, and 1, 2, 3, 5, and 50, New Series.

Colorado. — Bulletin 3.

Connecticut (New Haven Station). — Bulletins 1 to 67, inclusive. Annual Reports for 1877 to 1883, inclusive, except that for 1878.

Indiana (Purdue Univ. School of Ag.). — Bulletin 1. College Reports 1 to 14, inclusive.

Kentucky. — Bulletin 10.

Michigan. — 6th Annual Report, for 1892–93. (Contained in Report of Michigan Board of Agriculture, 1893.)

Missouri. — Bulletins 9, 13, 15, 16, 19, 20, 25, 26, and 33 of Old Series. All Annual Reports since the 1st, for 1888.

New Jersey. — Bulletins 1, 4, 5, 15, 27, and 28.

New York (Cornell). — Annual Report, 1882–83 (Report of Agricultural Department of Cornell University).

North Carolina. — Bulletins 1 to 56, inclusive, and 69, 2d ed. Meteorological Division, Bulletin 2 (68*b*), and 2d and 3d Annual Reports, for 1888 and 1889. Special Bulletins 1 (77*a*) and 4 (82*a*). Weekly Weather Crop Bulletins 1–21, 1888; 1–24, 1889; 1–25, 1890; 2 and 4, 1891.

North Dakota. — 4th Annual Report, for 1893.

Ohio. — All Bulletins of First Series, except 16, 17, 18, and 19.

Oklahoma. — Bulletins 26 to 29, inclusive.

Pennsylvania. — Annual Reports for 1869, 1872, 1879–80, 1881, 1882, 1883, and 1884. [All issued by the State College.] Annual Report for 1895. Bulletin of Information No. 1.

South Carolina. — All Bulletins of the Old Series (previous to 1888) on the work of the Experimental Farm of the South Carolina College. 3d Annual Report, for 1890, and 6th, for 1893.

Texas. — College Bulletins 1–5, 1883–1887.

West Virginia. — Special Bulletin — Potash and Paying Crops, 1890. All Annual Reports later than the 3d, for 1890.

Wyoming. — Bulletins 1 to 4, 9, and 10.

Ontario Department of Agriculture, Toronto. — Bureau of Industries. — Agricultural Returns to the Ontario Bureau of Industries, Nov. 1882 (5th), Aug. 1883 (7th), and Nov. 1887 (20th).

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1897.

PART III,

BEING THE LIST OF

ACCESSIONS TO THE LIBRARY

DURING THE YEAR.

BOSTON:
PRINTED FOR THE SOCIETY.
1903.

See last page of cover; also list of Books Wanted, p. 337.

TRANSACTIONS

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Library Accessions, 1897.

In the following list the books purchased from the income of the Stickney Fund are marked S. F., and those purchased from the Society's Library Appropriation, L. A. All other publications were received by donation and exchange, the name of the donor being given in every instance when known.

The size of books is denoted by the terms fol., 4°, 8°, 12°, etc. Pamphlets are understood to be 8° unless otherwise stated.

Abbreviations.

ann. — annual.
bul. — bulletin.
cl. — cloth.
col. — colored.
ed. — edition.
Edinb. — Edinburgh.
fol. — folio.
frontis. — frontispiece.
lib'n. — librarian.
Lond. — London.
N. Y. — New York.
Phila. — Philadelphia.
pl. — plates.
pph. — pamphlet.
port. — portrait.
pres. — president.
rep't. — report.
San Fran. — San Francisco.
sec'y. — secretary.
ser. — series.
Strasb. — Strasburg.
Wash. — Washington.

GENERAL HORTICULTURE.

Gardening Year Book and Garden Oracle. 1897. By the Editor of "The Gardeners' Magazine." 39th year. 12°. pp. 314; col. pl. Lond.: (1897.) S. F.

Horticultural Directory and Year Book for 1897. 38th year. 16°. pp. 536. Lond.: (1897.) S. F.

Stringfellow, H. M. The New Horticulture. 8°. pp. 216; portrait, cuts. Galveston: 1896. S. F.

Hibberd, Shirley. Rustic Adornments for Homes of Taste; containing suggestions for the floral embellishment of the home, the garden, balcony, window, greenhouse and conservatory; with hints on the formation and management of fresh-water and marine aquariums, vivariums, etc. A new edition. Revised by T. W. Sanders. 8°. pp. 344; col. frontis., cuts. Lond.: 1895. S. F.

GENERAL HORTICULTURE *continued.*

Tricker, William. The Water Garden. Embracing the construction of ponds, adapting natural streams, planting, etc. 4°. pp. 120; 9 pl., 18 views, cuts. N. Y.: 1897. S. F.

Milman, Helen, (Mrs. Caldwell Crofton). In the Garden of Peace. 2nd ed. 8°. pp. 182; frontis., pl., cuts. Lond. & N. Y.: 1896. S. F.

Dew-Smith, A. M. Confidences of an Amateur Gardener. 8°. pp. 299. pl., etc. Lond.: 1897. S. F.

[**Tracts** on Gardening;] containing the following:

Taylor, Adam. A Treatise on the Ananas or Pine-Apple, etc. To which are added, full directions for raising Melons. pp. 62; 2 col. pl. Devizes: 1769.

Hints for the Management of Hot-Beds, and directions for the culture of early Cucumbers and Melons. To which are added brief instructions for pruning Wall and Espalier Trees. pp. 31. Bath & Lond.: 1790.

Fordyce, Sir William. The Great Importance and Proper Method of Cultivating and Curing Rhubarb in Britain, for medicinal uses, with an appendix. pp. 27. Lond.: 1792.

A New Treatise on the Art of Grafting and Inoculation, etc. To which are added, Directions for chusing the best Stocks for that purpose. Etc. By an Experienced Practitioner in this branch of Gardening. pp. 52. Salisbury: 1780.

Raley, William. A Treatise on The Management of Potatoes; or, a New Method of Removing and Preventing the Disorder thereof called Curl'd Tops, and restoring them to their Primitive State and Perfection. Etc. pp. 43. York: 1782.

12°. S. F.

(**Hill,** Thomas.) *Pseud.* D(idymus) M(ountain). The Gardeners Labyrinth, or, A New Art of Gardening: wherein is laid down new and rare inventions and secrets of Gardening not heretofore known. Etc. Collected from the best approved Authors, besides forty years' experience in the Art of Gardening. By D. M. And now newly corrected and enlarged. 12°. pp. 90; cuts. Lond.: 1652. The Second Part. pp. 173. Lond.: 1851. S. F.

O'Mara, Patrick. The Professional Gardener's Mission in Horticulture. (Paper read before the Lenox (Mass.) Horticultural Society, Jan. 16, 1897.) Pph. 8°. pp. 7. The Author.

Herendeen Manufacturing Company, Geneva, N. Y., *Publishers.* A Treatise on Greenhouse Heating in connection with the Furman Boiler. Pph. pp. 84; cuts. The Publishers.

HORTICULTURAL JOURNALS.

Gardeners' Chronicle and Agricultural Gazette for 1858. Fol. pp. 952. Lond.: 1858. L. A.

HORTICULTURAL SOCIETIES.

American.

American Association of Nurserymen. Rep't. of 22d Ann. Meeting, St. Louis, June 9–10, 1897. Pph. pp. 85. J. W. Manning.

Chicago Horticultural Society. Preliminary List of Premiums for the Fall Exhibition, Nov., 1897. Pph. pp. 12. Edgar Sanders.

Columbus (Ohio) Horticultural Society. Ann. Rep't. for year ending Dec. 31, 1896. Containing Constitution, List of Members, and Quarterly Journal. Vol. XI. 8°. pp. 147; port., pl. Columbus: 1897. The Secretary.

Hampden County Horticultural Society Annual. 1897. 35th year. Pph. pp. 48; cuts. Springfield, Mass.: 1897. W. J. Eldred.

Illinois State Horticultural Society. Transactions for 1896. Being Proceedings of 41st Ann. Meeting, Springfield, Dec. 29–31, 1896, etc. New Ser., Vol. XXX. 8°. pp. 492; 2 pl., cuts. Springfield: 1897. H. M. Dunlap, Secretary.

Indiana Horticultural Society. Transactions for 1896, being a report of the 36th Ann. Meeting, Indianapolis, Dec. 1–3, 1896. Together with reports of the Summer Meeting, Richmond, June 12 and 13, and of Local Societies, Selected papers, etc. 8°. pp. 225. Indianapolis: 1897. The Secretary.

Kansas State Horticultural Society. 4th Biennial Report, containing Proceedings of the Annual Meetings held Dec. 1894 and Dec. 1895. Vol. XX. 8°. pp. 100. Topeka: 1896.

Transactions, containing the Proceedings of the summer meeting June 1896 and the Annual Meeting, Dec. 1896. Vol. XXI. 8°. pp. 100. Topeka: 1897. Wm. H. Barnes, Secretary.

Melrose Amateur Gardeners' Society. Schedules of Prizes for exhibitions of June 21 and Sept. 6, 1897, with Rules. Pph. pp. (8.). Geo. A. Wills, Secretary.

Minnesota State Horticultural Society. Ann. Rep't. 1896. Embracing Transactions of the Society from Dec. 3, 1895 to Dec. 1, 1896, including the 12 nos. of "The Minnesota Horticulturist" for 1896. Vol. XXIV. 8°. pp. 542; pl., port's., cuts, etc. Minneapolis: 1896. A. W. Latham, Secretary.

Missouri State Horticultural Society. 39th Ann. Rep't. 1896. 8°. pp. 404; frontis., pl. Jefferson City: 1897. L. A. Goodman, Secretary. [20 copies.]

HORTICULTURAL SOCIETIES, *continued.*

Monmouth County (N. J.) Horticultural Society. Premium List of Exhibition at Red Bank, N. J., Sept., 1897. Pph. pp. 15. George Steele, Secretary.

New Jersey State Horticultural Society. Proceedings. 22nd Ann. Session, Jan., 1897. Pph. pp. 217; port. Mount Holly: 1897. H. I. Budd, Secretary.

New York Horticultural Society. Inaugural Discourse delivered at their Anniversary Meeting, 31st August, 1824. By David Hosack, M. D., F. L. S., President of the Society, Pph. pp. 46. N. Y.: 1824. L. A.

Rhode Island Horticultural Society. Premium List, June Exhibition, 1897, Providence, R. I. Pph. pp. 8 C. W. Smith, Sec'y. & Treas.

St. John Horticultural Association's Exhibition of Flowers and Plants, Aug. 25–27, and Chrysanthemum Exhibition, Nov. 11–12, 1896. Prize List and Rules. Pph. pp. 45; frontis., plans, cut. St. John, N. B.: 1896. James Reynolds, Sec'y.

Western New York Horticultural Society. Proceedings. 24th Ann. Meeting, Rochester, Jan. 25–27, 1882. Pph. pp. 156. Rochester: 1882. Prof. W. J. Beal.

West Virginia State Horticultural Society. 5th Ann. Meeting, Oct. 12, 1897. pp. 402–419. (Contained in the West Virginia Farm Reporter, No. 12, Dec. 1897. Pph. Charleston: 1897.) L. C. Corbett, Sec'y.

Wisconsin State Horticultural Society. Ann. Rep't. for 1895-96. Vol. XXVI. 8°. pp. 279; port., pl., cuts. Madison: 1896. The Sec'y.

Worcester County Horticultural Society. Transactions. 1896–97. Parts I and II. 2 pph's. 8°. pp. 32, 64. Worcester: 1897.

Schedule of Premiums for 1897. Pph. 8°. pp. 34. Worcester: 1897. The Sec'y.

Foreign.

Royal Horticultural Society.

Journal. Vol. XVI, *pts. 2 and 3.* Jan. 1894. pp. 161–261, cxvii-ccxxxviii; cuts. Vol. XX, *pts. 2 and 3.* Nov. 1896 and March, 1897. pp. 77–296, cxxix–ccxxviii. Vol. XXI, *pt. 1.* Aug. 1897. pp. 152, c; 23 cuts. Lond.: 1894–'97.

Report of the Council for 1896–'97, with list of Fellows, Associates and Affiliated Societies. pp. 92. Lond.: 1897.

Arrangements for the year 1897. pp. 58. Lond.: 1897.

Pph's. Rev. W. Wilks, Secretary.

Amateur World of Horticulture and Record of the Proceedings of the National Amateur Gardeners' Association. Vol. I, 1896, Nos. 1–4; Vol. II, 1897, Nos. 5 and 6. Pph's. pp. 93 and 57. Brentwood, Eng.: 1896, '97. Leonard Brown, Secretary.

Royal Caledonian Horticultural Society. Prize List and Rules for Spring and Autumn Flower Shows, Edinburgh, Apr. 7 & 8, and Sept. 8 & 9, 1897. Pph. pp. 24. The Society.

France, Société nationale d'Horticulture de. Journal. 3rd Série, Tome XIX, 1897. 8°. pp. 1376. Paris: 1897.

Liste générale des membres de la Société. 1er Mars 1897. 8°. pp. 191. Paris: (1897).

Congrès horticole de 1897. Mémoires préliminaires. 8°. pp. 179. Paris: (1897). Procès-verbal de la Séance. 8°. pp. 22. Paris: (1897). The Society.

Seine-Inférieure, Société centrale d'Horticulture du Département de la. Bulletin. 2e Série. Tome I. 1897. 8°. pp. 437. Rouen: 1897. The Society.

Sarthe, Société d'Horticulture de la. Bulletin. Tome XIII.—1897, 1er–3e trimestres. 8°. pp. 153–252. Le Mans: 1897. The Society.

Société d'Horticulture d'Orléans et du Loiret. Bulletin. 3e Série. Tome IV. Nos. 1–4, 1897. 8°. pp. 152. Orléans: 1897–'98.

68e exposition de Chrysanthèmes, etc., 6–10 Nov., 1897. Pph. pp. 8. Eugène Delaire, Secrétaire-général.

Cercle Horticole du Nord. Bulletin. 28me vol. Année 1897. 12°. pp. 288. Lille: 1897. The Society.

Nord-Horticole. Bulletin mensuel d'Arboriculture, de Floriculture et de Culture potagère. (Organe de la Société des Chrysanthémistes du Nord de la France, etc.) 2e année. 1897. 8°. pp. 348, 10. Lille: 1897. The Publishers.

Gartenflora. Zeitschrift für Garten- und Blumenkunde. (Begründet von Eduard Regel.) Organ des Vereins zur Beförderung des Gartenbaues in den preussischen Staaten. 46. Jahrgang. 1897. Herausgegeben von Dr. L. Wittmack. 8°. pp. 670; col. pl. 1434–1445, cuts. Berlin: 1897. The Editor.

Hamburg, Allgemeine Gartenbau-Ausstellung in. Mai–Sept., 1897. Programmes, etc. 5 pph's. 12°.

Wiener Illustrirte Garten-Zeitung. Organ der k. k. Gartenbau-Gesellschaft in Wien. 22. Jahrgang, 1897. 8°. pp. 417; 4 col. pl., cuts. Wien: 1897. The Vienna Horticultural Society.

R. Società Toscana di Orticultura. Bullettino. Anno XXII.—1897. (Vol. II della 3a. Serie.) 4°. pp. 288; 12 pl., cuts. Firenze: 1897. The Society.

Genève, Société d'Horticulture de. Bulletin. 42me année. 1897. 8°. pp. 196. Genève: 1897. The Society.

Japanese Horticultural Society. Journal. Nos. 77, 78, 80–83. Oct. 1896–Nov. 1897. 8°. Tokyo: 1896–'97.

FLOWERS AND ORNAMENTAL PLANTS.

Hillhouse, Lizzie Page. House Plants and how to succeed with them. A practical hand-book. 12°. pp. ix, 220; cuts. N. Y.: 1897. S. F.

Castle, Lewis. Flower Gardening for Amateurs, in town, suburban, and country gardens. With a chapter on the greenhouse. 12°. pp. 236; frontis., cuts. Lond.: 1888. S. F.

D'Ombrain, Rev. H. Honywood, *Editor.* The Rosarian's Year-Book for 1897. 12°. pp. 69; port. Lond. & Derby: n. d. S. F.

Easlea, Walter. The Hybridization of Roses. The National Rose Society's Prize Essay. Pph. 12°. pp. 35. Edinb.: 1896. L. A.

Baltet, Charles. Étude comparative des différents sujets propres au greffage des Rosiers. (Soc. nat. d'Hort. de France.) Pph. pp. 18. Paris: 1897. The Author.

Hansen, Geo. The Orchid Hybrids. Enumeration and Classification of all hybrids of Orchids published up to October 15, 1895. (Including First Supplement.) Pph. 8°. pp. 257. Lond. and Berlin: 1895. *Also* Second Supplement. Recording knowledge gained about Orchid Hybrids in the period from October 15, 1895, to April 1, 1897. Pph. pp. 258–334. Berkeley, Cal.: 1897. S. F.

Linden, J., and Lucien Linden. Lindenia: Iconography of Orchids. [English Edition.] Vol. 12, pts. 68–78. Sept. 1896 to July, 1897. 4°. pp. 13–53; col. pl. 533–576. Brussels: 1896, '97. S. F.

Cogniaux, A., et A. Goossens. Dictionnaire iconographique des Orchidées. Parts 1–6. Col. pl. with descriptive text. (Bruxelles: Oct. 1896 to Mar. 1897.) S. F.

Warner, Robert, F. L. S., F. R. H. S., and Henry Williams, F. L. S., F. R. H. S. The Orchid Album, comprising coloured figures and descriptions of new, rare and beautiful Orchidaceous Plants. Vol. XI, pts. 131 and 132. (Completion of the work.) 4°. Col. pl. 521–528, with descriptive text. Lond.: (1897?). S. F.

Grant, Capt. Bartle, *Compiler.* The Orchids of Burma, (including the Andaman Islands,) described. Compiled from the works of various authorities. 8°. pp. 424. Rangoon: 1895. S. F.

Marie, Théodore, et J. Lormoy. Les Orchidées et M. Georges Mantin. 2e éd. Pph. pp. 40; frontis. Paris: 1894. Georges Mantin.

Ravenscroft, B. C. Chrysanthemum Culture for Amateurs: containing full directions for the successful cultivation of the Chrysanthemum for exhibition and the market. 12°. pp. 112; 22 cuts. Lond.: n. d. S. F.

Vilmorin, Henry-L. de. Le Chrysanthème. Histoire, physiologie et culture en France et a l'étranger. Pph. 4°. pp. 28; 10 cuts. Paris: 1896. L. A.

Nord-Horticole. Numéro spécial au Chrysanthème. (No. 7, Nov. 1896.) Pph. pp. 169–232. Lille: (1896). The Publishers. [2nd copy.]

Florilegium Harlemense. Colored plates with descriptions of bulbous and tuberous rooted plants, published under the auspices of the council of the "Algemeene Vereeniging voor Bloembollencultuur," Haarlem. Parts 1–3. Pph's. 4°. 3 col. pl. in each part. Haarlem: 1896. S. F.

Dean, Richard, John Ballantyne, Robert Fife, Stephen Jones, and William Cuthbertson. The Dahlia: its History and Cultivation. With illustrations of the different types, and a very complete list of the varieties in cultivation in 1896. (Dobbie's Horticultural Handbooks.) 12°. pp. 81; frontis., 8 pl., cut. Lond., N. Y. and Rothesay: 1897. S. F.

Peacock, Lawrence K. The Dahlia: a practical treatise on its habits, characteristics, cultivation and history. Pph. pp. 56; frontis. cuts. Atco, N. J.: (1896). The Author.

Sweet Pea Review, by the Sunset Seed and Plant Co. 2nd ed. Pph. pp. 32; 6 pl. San Fran.: 1897. Rev. W. T. Hutchins.

(Lilies, 45 hand-painted Japanese drawings of. With Japanese names.) Fol. Prof. John Robinson.

FLORICULTURAL SOCIETIES.

American Florists, Society of. Proceedings, 13th Ann. Convention, Providence, R. I., Aug. 17–20, 1897. Pph. pp. 149; port. n. p.: 1897. William J. Stewart, Sec'y.

American Chrysanthemum Society. Rep't. of Committee on Classification of Chrysanthemums, Washington, Aug., 1892. Pph. pp. 37. E. A. Wood.

Chrysanthemum Society, The National. Ann. Rep't. Financial Statement, 1896. Schedule of Prizes, 1897. Pph. pp. 96. (London: 1897.) C. Harman Payne, Foreign Corresponding Secretary.

St. Louis Florists' Club. Premiums, 7th Chrysanthemum Exhibition, Nov., 1897. Pph. pp. 24. The Sec'y.

Milwaukee Florist Club. List of 7th Ann. Flower Show, Nov. 1897. Pph. pp. 20. The Sec'y.

Association pour la Protection des Plantes. Bulletin No. 15, 1897. Pph. pp. 23; 2 pl. Genève: 1897. H. Correvon.

FRUITS.

Thomas, John J. The American Fruit Culturist, containing practical directions for the propagation and culture of all fruits adapted to the United States. 20th ed. Revised and Enlarged by William H. S. Wood. 8°. pp. 758; 796 cuts. N. Y.: 1897. S. F.

FRUITS, *continued.*

Bailey, L. H. The Principles of Fruit-Growing. (The Rural Science Series.) 12°. pp., 508; 114 cuts. N. Y. & Lond.: 1897. S. F.

Hogg, Robert. The Apple and its varieties. Being a history and description of the varieties of apples cultivated in the gardens and orchards of Great Britain. 8°. pp. 306; cuts. Lond.: 1859. S. F.

Saunders, William. Past Experience and Future Prospects of Fruit Growing in the Canadian Northwest. (*From* Trans. Roy. Soc. of Canada. 2nd Ser. 1896–97. Vol. II, Section IV.) Pph. pp. 131–136. Ottawa, Toronto, and London, Eng.: 1896. The Author.

Woburn Experimental Fruit Farm. Report on the working and results since its establishment. 1st rep't., 1897. By the Duke of Bedford and Spencer U. Pickering, F. R. S. 8°. pp. 194; 17 cuts. Lond.: 1897. The Duke of Bedford.

Charlton, John S., *Editor.* The Fruit Belt of Mesa County, Western Colorado. Pph. pp. 27; maps, cuts. The Editor.

FRUIT GROWERS' SOCIETIES.

Massachusetts Fruit Growers' Association. Rep't. of 3rd Ann. Meeting, Worcester, March, 1897. Pph. pp. 58. Worcester: 1897.

———. List of Officers; Objects and Aims of the Association; Notices of Meetings held. Pph. pp. (4). George Cruickshanks, Pres.

Maine State Pomological Society. Schedule of Premiums at the Consolidated State Fair to be held with the Maine State Agricultural Society, Lewiston, Aug. 30–Sept. 3, 1897, being the 25th Ann. Exhibition of the Maine State Pomological Society. Pph. pp. 16. D. H. Knowlton, Sec'y.

Ohio Pomological Society. 13th Rep't. 1866. Pph. pp. 78. Columbus: 1866. Geo. W. Campbell.

Ontario Fruit-Growers' Association. 28th Ann. Rep't. 1896. Pph. pp. 142; 2 port's. Toronto: 1897. L. Woolverton, Sec'y.

La Pomologie Française. Journal de la Société Pomologique de France. 1897. 8°. pp. 400. Lyon: 1897. Louis Cusin, Secrétaire-général.

VEGETABLES.

Bailey, L. H. The Forcing-Book. A Manual of the cultivation of Vegetables in glass houses. (The Garden-Craft Series.) 12°. pp. 266; 88 cuts. N. Y. and Lond.: 1897. S. F.

Green, Samuel B. Vegetable Gardening. A manual on the growing of Vegetables for home use and marketing. Prepared especially for the classes of the School of Agriculture of the University of Minnesota. 12°. pp. 224; 118 cuts. St. Paul: 1896. S. F.

Dreer, Henry A., Incorporated, *Publishers.* Vegetables under Glass. A little handbook telling how to till the soil during twelve months of the year. 2nd ed. 12°. pp. 104; frontis., cuts. Phila.: 1896. S. F.

Rolfs, P. H. Vegetable Growing in the South for Northern Markets. Etc. 12°. pp. 255; cuts. Richmond: 1896. S. F.

LANDSCAPE GARDENING, ETC.

Rose, N. Jönsson-. Lawns and Gardens. How to plant and beautify the home lot, the pleasure ground and garden. 4°. pp. 414; frontis., 172 cuts. N. Y. & Lond.: 1897. S. F.

Van Rennselaer, M. G. A Suburban Country Place. [Holm Lea, the home of Prof. C. S. Sargent.] (*From* Century Magazine, May, 1897.) pp. 3–17; cuts. J. D. W. French.

Sturgis, R. Clipston. Suburban Homes. (*From* The Cosmopolitan, June, 1896.) pp. 180–190; 8 cuts. J. D. W. French.

Stowe: a description of the Magnificent House and Gardens of the Right Honorable George Grenville Nugent Temple, Earl Temple, Viscount and Baron Cobham. Embellished with a general plan of the Gardens. Etc. New ed. 8°. 9 plans. Buckingham: 1783. S. F.

Blondel, Jacques-François. De la Distribution des Maisons de Plaisance, et de la décoration des édifices en général. 2 vols. 4°. (I.) pp. 198; frontis., 44 pl. Paris: 1737. (II.) pp. 180; 183 pl., (numbered 1–99). Paris: 1738. S. F.

PARKS AND CEMETERIES.

Metropolitan Park Commissioners. (Ann.) Rep't. Jan. 1897. 8°. pp. 89; 10 pl., 2 maps. Boston: 1897. The Commission.

Boston Department of Parks. (22d) Ann. Rep't. of Board of Commissioners for year ending Jan. 31, 1897. Pph. pp. 68; 6 pl. The City of Boston.

Lynn Park Commissioners. 8th Ann. Rep't. for year ending Dec. 19, 1896. Pph. 8°. pp. 12, frontis., 2 pl. Lynn: 1897. Nathan M. Hawkes, Sec'y.

Worcester Parks-Commission. Ann. Rep't. for the year ending Nov. 30, 1896. Pph. pp. 16; port. 2 pl. Worcester: 1897. James Draper, Sec'y.

Davis, Gherardi. The Establishment of Public Parks in the City of New York. (Read before the New York Historical Society, April 6, 1897.) Pph. pp. 46. (N. Y.: 1897.) The N. Y. Historical Society.

Brooklyn Department of Parks. 38th Ann. Rep't. for 1896. 8°. pp. 232; frontis., pl., cuts. Brooklyn: 1897. John E. Smith, Sec'y.

PARKS AND CEMETERIES, *continued.*

Niagara State Reservation. 11th Ann. Rep't. 1893–94. 8°. pp. 86, 126; pl., plans, cuts. Albany: 1895.

12th Ann. Rep't. 1894–95. Pph. 8°. pp. 61; pl. Albany & N. Y.: 1896.

13th Ann. Rep't. Transmitted Feb. 1, 1897. Pph. pp. 60; 8 pl. Albany and N. Y.: 1897. Andrew H. Green, Pres. Board of Commissioners.

Brooklyn Tree Planting and Fountain Society. Ann. Rep't. Dec. 1896. Pph. pp. 104; 2 port's., cuts. Brooklyn: 1897.

Circulars 16–20. May, 1896–June, 1897. Lewis Collins, Secretary.

Lincoln Park (Chicago). Report of Commissioners. 1896–97. Pph. pp. 31; frontis., cuts. Chicago: 1897. Edgar Sanders.

South Park (Chicago) Commissioners. Report to the Board of County Commissioners of Cook County. Dec. 1, 1895 to Dec. 1, 1896. Pph. pp. 42; plan. Chicago: 1897. Edgar Sanders.

Ontario, Provincial Instructor in Road-making. Report, 1896. Pph. pp. 80; pl. Toronto: 1897. Hon. James Dryden, Minister of Agriculture.

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Michaux, F. Andrew. The North American Sylva, or a description of the Forest Trees of the United States, Canada and Nova Scotia, etc. (Translated from the French of F. Andrew Michaux). Vol. I (of the 2-vol. edition). 8°. pp. 385; 75 col. pl. Paris: 1819. S. F.

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PERIODICALS PURCHASED.

American.—Garden and Forest.
Meehan's Monthly.
Fern Bulletin.
Country Gentleman.
American Naturalist.
American Journal of Science.

English. — Gardeners' Chronicle.
Gardeners' Magazine.
Journal of Horticulture.
The Garden.
Gardening Illustrated.
Gardening World.
Orchid Review.
Curtis's Botanical Magazine.
Journal of Botany.
Nature.

French. — Revue Horticole.
Lyon Horticole.
Revue des Eaux et Forêts.
Journal des Roses.

Belgian. — Revue de l' Horticulture Belge et Étrangère.
La Semaine Horticole.

German. — Botanische Zeitung.

PERIODICALS RECEIVED IN EXCHANGE.

American.— American Gardening.
Gardening.
Amateur Gardening.
How to Grow Flowers.
Vick's Illustrated Monthly Magazine.
The Mayflower.
Success with Flowers.
National Nurseryman.
Northwest Horticulturist.
Eastern New York Horticulturist.

PERIODICALS RECEIVED IN EXCHANGE, *continued.*

Southern Florist and Gardener.
Canadian Horticulturist.
American Florist.
Florists' Exchange.
Florist's Review.
New England Florist.
Sharon Cactus Guide.
Green's Fruit Grower.
Strawberry Culturist.
Grape Belt.
Montana Fruit Grower.
Park and Cemetery.
Botanical Gazette.
Plant World.
Asa Gray Bulletin.
Erythea.
Pittonia.
Massachusetts Ploughman.
New England Farmer.
American Cultivator.
New England Homestead.
Maine Farmer.
Rural New-Yorker.
Farm Journal.
California Cultivator.
Prairie Farmer.
Maryland Farmer.
National Stockman and Farmer.
Irrigation Age.
The Industrialist.
Canadian Entomologist.
Ottawa Naturalist.
West American Scientist.
Boston Evening Transcript.
Boston Morning Journal.
Boston Daily Globe.
Boston Daily Advertiser.
Boston Traveler.
Boston Times.

FOREIGN. — Garden and Field (Adelaide, So. Australia.)
Queensland Agricultural Journal.
New South Wales Agricultural Gazette.
Indian Gardening.

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BY THE

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☞ *Persons having any of the books in the following list to dispose of will oblige by addressing the "Librarian of the Massachusetts Horticultural Society, 300 Massachusetts Ave., Boston."*

Album de Pomologie, Vol. 2.

Amateur World of Horticulture. Title-page and Index to Vol. II.

American Agricultural Annual. Nos. 1 and 2, 1867 and 1868.

American Agricultural Association Review and Journal, Vol. 3, No. 2, Feb. 1883; No. 4, Apr. 1883; and New Series, No. 4, Apr. 1884.

American Cemetery Superintendents, Association of. Proceedings of 8th Annual Convention, 1894.

American Farmer. Fifth series. Vol. 3, Nos. 7–12, January to June, 1862, and the succeeding volumes to 1873, inclusive, also the numbers for October and December, 1877, and April to December, inclusive, 1878.

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Bon Jardinier, Le. 1831 to 1835 inclusive, 1837 to 1840, 1842 to 1850, 1852 to 1855, 1858, 1859, 1861, 1873.

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California Agricultural Society. Reports for 1864, '65, '66, '67, '74, '77, '81, '86. Also Reports previous to that for 1863 (being reports of the Society previous to its re-organization).

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Christie, Thomas. New Commercial Plants. No. 12.

Colorado State Board of Horticulture. Ann. Rep't. for 1900.

Columbia College, Contributions from the Herbarium of.

No. 4. A List of the Plants collected by Miss Mary B. Croft, at San Diego, Texas. (Except "Additions.")

No. 12. The Genus Eleocharis, etc.

No. 23. The American Species of the Genus Anemone, etc.

No. 34. The North American Species of Lespedeza.

Connecticut State Agricultural Society. Transactions, 1857–'59.

Debeaux, O. Contributions a la flore de la Chine. Fasciculus 4.

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Farm and Garden. July and subsequent numbers. New York: 1853.

Fielding, H. B., assisted by George Gardner. Sertum plantarum. All that was published of Vol. II.

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Genesee Farmer. Vols. 4–7, 1834–'37, 1st series, and Vols. 1–16, (1840)–1855, 2d series.

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Horticultural Directory and Yearbook. 1860–'67, 1869–'71, 1873–'84 and 1886–1890.

Horticultural Times and Covent Garden Gazette. Vol. 1, No. 1 and title-page and index; Vol. 2, title-page and index; Vol. 12, No. 311 and title-page and index; Vol. 14, title-page and index; Vol. 15, title-page and index; Vol. 16, title-page and index; Vol. 17, title-page and index, and all later than Vol. 17, No. 404.

Illinois Entomological Reports; First, by B. D. Walsh, for 1867.

Indiana Horticultural Society. Transactions at the first eight sessions, previous to 1870, except the 3d, 5th, 6th, 7th, and 9th for 1864, 1866, 1867, 1868, and 1870.

Industrialist. Vols. 1–14, and Nos. 1–17 of Vol. 15.

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Kansas State Board of Agriculture. 3d and 8th Biennial Reports, for 1881–82 and 1891–92.

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L'Héritier, C. L. Stirpes Novæ. Fasc. 5 and 6, pp. 103–184, plates 49–84.

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Maryland Farmer. Vol. XII, No. 3, March, 1875.

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Montana Fruit Grower. Vol. 1. Nos. 2, 7, 9 and 10, 1895–96.

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New Hampshire Forest Commission. 1st rep't. of the present Commission, for 1893.

New Jersey Forestry, Reports on. (From Reports of N. J. Geological Survey). All previous to 1894.

New Jersey Horticultural Society. Annual Reports. 5th and 14th sessions, 1880 and 1888.

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New York Farmers. Proceedings, 1882–'84 (1st vol.), and 1893–'94.

New York State Agricultural Society. Journal. Vol. 13, Nos. 10, 11, and 12. Vol. 14, Nos. 3, 5, 7, and 9–12. Vol. 15, Nos. 3, 4, 6, 7, and 12. Vol. 16, No. 2; and the whole of Vols. 17, 18, and 19.

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North Carolina Horticultural Society. 2d–12th Annual Reports.

Northern Gardener, The. Vols. 1–3; Vol. 5, title-page and index; Vol. 6, title-page and index; and its successor, British Gardening, Vol. 8, 4 plates (in Nos. 219, 220, 227 and 229), and all later than Vol. 10, No. 266.

Northwest Fruit Growers' Association. 2nd to 7th Reports.

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Ohio State Board of Agriculture. Annual Reports: 1st and 3d, 1846 and 1848; 6th–8th, 1851–1853; 10th, 1855; 25th–34th, 1870–1879.

Ontario Department of Agriculture. Bureau of Industries. 1st to 4th Annual Reports, 1882–1885.

Ontario Fruit Growers' Association. Reports previous to 1869 and 2d Report, 1871.

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Oregon State Board of Horticulture, 3d Biennial Report, 1895.

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Ortega, C. G. Novarum aut rariorum plantarum horti Matritensis, etc. Decades 5–10 inclusive.

Ortolano, L'. October and November numbers for 1864. Trieste.

Our Country Home. Vol. 5, No. 4; Vol. 8, No. 4; Vol. 9, Nos. 6 and 9; Vol. 10, Nos. 8, 10, 11, and 12.

Pallas, P. S. Flora Rossica. Vol. 2, Part 1.

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Pennsylvania Fruit Growers' Society. Reports previous to 1867.

Phytologist, The. General Index to the 2d Series.

Piper, R. U., M.D. The Trees of America. No. 3. 4to. Boston: 1858.

Plenck, J. J. Icones plantarum medicinalium, etc. Vol. 6, except fascicles 1–3; Vol. 7; Vol. 8.

Plow, The. Vol. 1, No. 1. New York: 1852.

Pomologie Française, La. Series 1 to 3, inclusive.

Purdy's Fruit Recorder. Vol. 1, 1869; Vols. 1–3 (2d ser. ?), 1891–93; and also 1874 wants Nos. 5 and 6; 1878, No. 6; 1894, Nos. 2 and 8–12; 1895, Nos. 2–12.

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